PB83-189993

Profile of Nine State and Local Air Pollution Agencies

(U.S.) Environmental Protection Agency
Washington, DC

Feb 81

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of
Planning and Evaluation
Washington DC 20460

February 1981

PB83-139993

EPA

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TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO. PB83 189993
4. TITLE AND SUBTITLE Profile of Nine State and Local Air Pollution Agencies		5. REPORT DATE February 1981
		6. PERFORMING ORGANIZATION CODE 85359-8
7. AUTHOR(S) James S. Vickery, Lori Cohen, and James Cummings		8. PERFORMING ORGANIZATION REPORT NO. 230-02-83-002
9. PERFORMING ORGANIZATION NAME AND ADDRESS Environmental Protection Agency Program Evaluation Division (OMSE/OPRM) 401 M Street, S.W. Washington, D.C. 20460		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Same as box 9.		13. TYPE OF REPORT AND PERIOD COVERED Final Report
		14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

Prepared in cooperation with the Council on Environmental Quality.

16. ABSTRACT

A review of the programs and practices of nine air pollution agencies concerned about the problem of continuous compliance with their requirements. This joint study performed by EPA and CEQ examined the organizations, Permit Systems, Inspection and Surveillance Approaches, and Enforcement Programs of the States of CT, NY, NJ, NC, OR, and the cities of Chicago, Houston, and San Diego. Comparative review of each jurisdiction's programs is presented by function, and suggested strategy is presented for agencies wishing to control the continuous compliance (or operation and maintenance of control equipment) problem.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
	Air Pollution Agencies: State and Local, Continuous Compliance Programs, Operation and Maintenance Programs, Permiting Programs, Inspection and Surveillance Programs, Env. Enforcement Programs	

18. DISTRIBUTION STATEMENT Release Unlimited	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 175
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

PROFILE OF NINE STATE AND LOCAL AIR POLLUTION AGENCIES

February 1981

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EXECUTIVE SUMMARY

Purpose

The primary thrust of the nation's air pollution control programs has been to compel air polluting sources to install control equipment, and thus attain initial compliance with air quality regulations. In 1978, the EPA Administrator set up the Operations and Maintenance Task Force to find a way to ensure that regulated sources of air pollution continuously comply with emission standards over time.

To identify the magnitude and causes of emissions in excess of the standards and to examine State and local agency practices that address continuous compliance problems, the Council on Environmental Quality and EPA conducted two related studies. Each study focused on 2 basic tasks which will be described below.

The purpose of this report is to summarize and integrate the findings of Task I of the CEQ/EPA studies. Task II findings are available in a separate report, The Integration of the Analyses of the Extent of the Excess Emissions Problems Associated with the Operation and Maintenance of Air Pollution Control Equipment (GCA Technology Division, Bedford, Massachusettes, July 1980).

Task I examined 6 State and 3 local air pollution control agencies to see how they currently address the continuous compliance problem. The agencies studied were the:

- Connecticut Department of Environmental Protection
- New York Department of Environmental Conservation

- New Jersey Department of Environmental Protection
- North Carolina Department of Natural Resources and Community Development
- Chicago Department of Environmental Control
- Iowa Department of Environmental Quality
- Houston Department of Health
- Oregon Department of Environmental Quality
- San Diego Air Pollution Control District

These agencies were selected for study because they were regarded by EPA and State and Territorial Air Pollution Public Administrators (STAPPA) as having the best source emissions data and inventories, inspection and enforcement programs, and documentation of agency activities and costs.

In Task II, emissions data was collected through the examination of 180 sources within the jurisdiction of the nine control agencies studied in Task I. The purpose of the analysis was to characterize the extent, nature and causes of excess emissions.

Major Findings

Task I findings indicate that:

- The nine agencies studied have the basic programs needed to attain continuous compliance. However, these programs currently emphasize initial compliance, and need to be modified to ensure continuous compliance.
  - All of the agencies studied impose general limitations on source emissions; yet these standards do not lend themselves to a ready determination of continuous compliance.

- Most State and local agencies notify sources of their emissions requirements through general public notice; but relying on general notice does not provide an adequate means of informing sources of complex requirements, such as those needed to attain continuous compliance.
- Some agencies use a permit as a means of notifying sources of their requirements; but even so, the agencies emphasize initial compliance -- failing to take advantage of the use of permits to impose O&M requirements.
- All agencies provide for detection of violation through the conduct of complaint investigations, surveillance, inspection and, in some cases, by requiring malfunction reports. Nevertheless, many continuous compliance violations remain undetected due to weaknesses in these detection strategies.
- All agencies have some means of proving violations, i.e. establishing their occurrence and their magnitude; however, problems of accuracy, reliability, and expense plague these techniques.
- All agencies have some system of progressive sanctions to remedy violations, but these sanctions are inappropriate and too cumbersome to be effective in correcting continuous compliance violations.

o The agencies studied address the continuous compliance problem in a piecemeal fashion. To solve the problem, each agency needs EPA support to implement a consolidated continuous compliance strategy.

Recommendations:

o We recommend the establishment of a continuous compliance strategy in which each State and local air pollution control agency will:

I. Target a few sources of concern based on size, location, industry and control system category, malfunction reports and compliance history.

II. Establish continually measurable, source-specific operating standards for these targeted sources.

III. Employ operating permit programs or enforcement authorities to make these requirements enforceable.

IV. Inspect sources for compliance with these specific operating standards.

V. Enforce against violators of the emission limits and operating standards.

- To address the design based causes of excess emissions, we recommend that the continuous compliance strategy be supplemented by:

VI. Orienting new source design reviews towards continuous compliance

VII. Developing minimal industry design standards in the private sector.

These programs will force control equipment designers to consider the long-term reliability and maintainability of their designs.

Chapter 1. INTRODUCTION

EPA's goal with regard to stationary sources of air pollution is to achieve compliance with applicable emissions limitations. Until recently, the determination of whether or not any given source is in compliance has been made primarily on the basis of whether that source has pollution control equipment in place that is believed to be capable of meeting the emissions standards. These determinations are supplemented, for some sources, with infrequent inspections of visual emissions and, for even a more limited number of sources, with infrequent stack tests. It is now generally acknowledged that due to several factors, plants with pollution controls may still not be meeting emissions requirements on a continuous basis. In 1978, the EPA Adminstrator set up the Operations and Maintenace Task Force to research the problem.

As a first step in the development of a solution to this problem, EPA and CEQ conducted two related studies. The first study, a joint effort by CEQ and EPA, looked at 2 State and 3 local agencies and 120 industrial sources. The second study sponsored by EPA alone examined 4 additional agencies and an additional 60 sources. In each case, the agencies and sources selected for study were believed to be exemplary in achieving compliance.

The common purpose of these two studies was to identify the magnitude and cause of the continuous compliance problem and to examine current State and local agency practices and needs in addressing the problem. To accomplish this dual-purpose, the studies, which were structured similarly, were each divided into two basic tasks.

Task 1 evaluated the current and proposed approaches of nine government agencies that are responsible for the implementation, maintenance and enforcement of air pollution control regulations. Specifically, information was collected on:

- the process by which permits, orders, or other legally enforceable pollution control measures are prepared;
- the self-monitoring and reporting requirements placed on dischargers;
- the agency's monitoring, inspection, sampling and data analysis procedures;
- the availability and imposition of sanctions against non-complying sources;
- the public administration costs of stationary source control programs; and
- proposed and potential systems and system elements which might be employed to effectively counter the excess emission problem.

The agencies were selected for Task 1 analysis on the basis of inputs from EPA Regional staff, STAPPA officers, and the EPA Offices for General Enforcement and Air Quality Planning and Standards. In general, these agencies were recognized as having good source emissions data and inventories, inspections and enforcement programs, and documentation of agency activities and costs. Thus, nine of the most effective and well-run agencies were selected for study. The agencies and the contractors conducting the studies are indicated in Table 1-1.

In Task II, emissions data was collected through the examination of 180 sources of air pollution (15-30 sources within the jurisdiction of each of the nine control agencies studied in Task I). The purpose of this data analysis was to characterize:

-- the extent of the excess emission problem; i.e., the number, duration and frequency of typical incidents of excess, and the magnitude and nature of those excesses;

-- the nature of the excess emissions problem; i.e., a description of the types, sizes, ages and other features of both the control systems and the control processes primarily associated with incidents of excess;

-- the causes of the excess emission problem; i.e., an identification and categorization of those causes leading to excesses according to whether or not they are preventable.

The 180 sources for Task II analysis were chosen based upon Agency recommendation and the following criteria:

o The source had achieved initial compliance, i.e., certified by the agency as having attained compliance with emissions standards.

Table 1-1 — AGENCIES REVIEWED AND CONTRACTORS WHO CONDUCTED THE ANALYSIS

	AGENCY STUDIED	CONTRACTOR
CEQ/EPA STUDY	New Jersey Department of Environmental Protection	Environmental Law Institute (ELI) with The Research Corporation (TRC)
	Houston Department of Health	
	North Carolina Department of Natural Resources and Community Development	Booz, Allen and Hamilton, Inc., with PEDCO
	San Diego Air Pollution Control District	
	Chicago Department of Environmental Control	Pacific Environmental Services
EPA O&M STUDY	New York Department of Environmental Conservation	GCA Technology Division
	Iowa Department of Environmental Quality	
	Connecticut Department of Environmental Protection	The Research Corporation (TRC)
	Oregon Department of Environmental Quality	

- The source's emissions history over a two to six year period contained reliable information and was available either in the agency files or on location at the source.
- The source emitted particulates, organic compounds, or sulfur oxides.
- The source was included in one of 15 selected major industrial categories.
- The source had to be willing to participate in the study.

The Task II study is the first major effort to quantify and evaluate the results of air pollution control activities over long periods of time. Although the selected sources were cooperative, complete documention on emissions data was frequently unavailable, and the contractors had to rely on anecdotal references to past problems. Nevertheless, the Task II data is believed to be the best available assessment of the continuous compliance problem.

Task II findings are available in a separate report. Characterization of Air Pollution Control Equipment Operation and Maintenance Problems (EPA, February 1981). Major findings are that 71% of the sources studied experienced documented incidents of excess emissions though they were reported as complying with standards. Analysis of the documented incidents indicates that on the average, sources experience 13 incidents per year, lasting an average of 64 hours per incident --

resulting in a cumulative annual excess of 25 percent of the allowed emissions level. The major causes for these excesses were determined to be: 1) improper operation and maintenance (O&M) of control systems; and 2) inadequate design of control systems.

This report is divided into two major parts. The first part contains Task I findings. Programs and problems common to the nine air pollution control agencies studied are discussed, and documentation of specific agency programs is provided. The second part of the report contains the conclusions and recommendations of the Operations and Maintenance Task Force which are based largely on Task I findings and Task Force members' working knowledge of emission standard setting, measurement and enforcement.

PART I: State and Local Agency Findings

INTRODUCTION TO PART I

Part I of this report represents a summary of the contractor's findings of the nine state and local agencies studied. The agencies studied were the:

- Connecticut Department of Environmental Protection
- New York Department of Environmental Conservation
- New Jersey Department of Environmental Protection
- North Carolina Department of Natural Resources and Community Development
- Chicago Department of Environmental Control
- Iowa Department of Environmental Quality
- Houston Department of Health
- Oregon Department of Environmental Quality
- San Diego Air Pollution Control District

The summary provides a general description of the purpose served by the agencies' permit, surveillance, inspection and enforcement systems; the basic processes through which these programs are implemented; and agency-specific descriptions of the programs.

The organization, similarities, differences and, where possible, the effectiveness of the agency programs is discussed. Note that EPA has attempted to draw only general comparisons of the agency programs. The best use of the agency findings is as an indicator of particular successes, and experiences of the regulatory agencies.

Chapter 2. OVERVIEW OF THE STATE AND LOCAL AIR POLLUTION CONTROL ORGANIZATIONS

The State and local air pollution control agencies are responsible for the implementation and enforcement of air pollution regulations. These agencies coordinate their activities with the Federal Environmental Portection Agency and various State agencies that also impact air pollution control, such as a State's Department of Health. The purpose of this chapter is to provide a description of how these agencies relate to one another. First, the Federal, State and local responsibilities will be defined. A model State agency will be described. Then specific State programs will be briefly discussed and agency organizations will be compared to one another.

2.1 Federal and State Air Pollution Control Responsibilities

The air pollution control programs of the nine State and local agencies can be most easily understood when placed within the framework of the Clean Air Act.

The Federal government, through the Environmental Protection Agency, is to set national standards for: ambient air quality, new source performance, prevention of significant deterioration, and hazardous emissions for new sources. It is each State's responsibility to develop a State Implementation Plan (SIP) to implement, maintain and enforce the Act's goals and subsequent standards.

Each SIP is to include an emissions inventory, limitations on emissions from stationary sources, a preconstruction review procedure for new and modified sources, compliance schedules for new and existing sources, and pollution monitoring procedures. To implement these and other SIP provisions, each State has a hierarchy of organizations that must coordinate their air pollution control activities.

It is difficult to compare individual State programs and organizational arrangements, for each program developed independently. Some of the programs grew in response to the Clean Air Act, while others developed prior to the Act. As a result, the State agencies do not operate according to a single plan. Although the agencies are organized and operate differently from one another, it is useful to describe a "model agency." The model described here incorporates the basic functions found among most agencies.

The model State air pollution control program has an Air Pollution Board (or Commission) that serves in a rule making and oversight capacity. The board promulgates rules and regulations as required by the SIP, conducts rule making and enforcement hearings and coordinates the activities of the operating line agencies.

A line agency, or State Air Pollution Control agency, is responsible for the implementation and initial enforcement of the board's regulations. This agency may be under the auspices of a State Department of Environmental Protection, Department of Health or Department of Natural Resources. These air pollution agencies must have provision for:

- engineering and technical services to monitor the ambient air quality, establish source emission inventories, develop meteorological data to model regional air quality and to define suggested standards and strategies;

- a permit or equivalent system for stationary sources;
- a surveillance system to detect non-complying facilities through field inspections and stack tests; and
- an enforcement system to provide legal support to the entire air pollution control program.

These activities may be conducted at the central office of the State agency, but are more often provided at a regional or local level as a supplement to central office activities. Regional and local offices provide the advantage of proximity to sources. This can be an aid to surveillance activities and enforcement negotiations. The regional or local offices handle most of the source-related work, such as inspections and stack testing. Ideally, assistance from State headquarters is necessary only in handling recalcitrants, technically complex cases, or special exemptions.

2.2 Specific State and Local Air Pollution Control Programs

To demonstrate how air pollution control programs vary from this model program, this section focuses on the actual organization of air pollution control programs in nine States. As mentioned in the introduction, the information reported here was extracted from two different studies. The first five States that are described below were part of the CEQ contract and have more detailed information regarding organization of State programs than the remaining four O&M study States.[1] This information should therefore be used to provide an indication of how the various State air pollution control programs operate, their major similarities and differences. Table 2-1 provides a summary of the state agencies that participate in the air pollution control programs for the areas studied.

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[1] Note that the agencies studied under the CEQ/EPA contracts are underlined.

In this discussion it is important to recognize the interplay and potential overlap between the types of agencies described. In addition, coordination with other agencies, such as local health departments, the office of the attorney general and local citizen groups, is also necessary for the operation of a smooth air pollution control program of the nine States studied.

California. In 1947, the State was divided into air pollution control districts (APCDs). Each of the districts is now functioning as a separate department under the California Health Care Agency. While each district has primary responsibility for stationary source control, the Calfornia Air Resources Board has the responsibility of carrying out Federal programs, the development of standards, general research and district oversight. Our contractor studied the San Diego APCD and found that a separate Air Pollution Hearing Board processes all variances, appeals and abatement orders in coordination with a Citizen Advisory Board. Legal actions are coordinated between the San Diego City Attorney's Office and the San Diego County District Attorney's office.

Illinois. There are three executive level agencies affecting air pollution control. The Illinois Pollution Control Board promulgates regulations and standards, and conducts all public hearings. The Illinois Environmental Protection Agency plans,

Table 2-1: INTERAGENCY ORGANIZATION FOR IMPLEMENTATION OF AIR POLLUTION CONTROL PROGRAMS IN NINE STATES

Major Program Coordinators / State	California	Connecticut	Illinois	Iowa	New Jersey	New York	North Carolina	Oregon	Texas
Board/Commission w/State Oversight Role	Air Resources Board	Commisoner of Dept. of Environ. Protection	Pollution Control Board	Air Quality Commiss.	Clean Air Council	State Environ. Board	Air Quality & Environ. Mgmt. Commission	Environ. Quality Commiss.	Texas Air Control Board (TACB)
State Line Agency	CA Health Care Agency	Office of Air Compliance	Illinois EPA	Dept. of Environ Quality	Dept of Environ. Protec.	State Dept of Conserv.	Dept of Nat. Resources & Commu. Dvlpt.	Dept of Environ Quality	TACB Operating Divisions
Regional Offices	Local Agencies	None	5 Reg. Offices	6 Reg. offices	4 Reg. Air Poll Control Agency (RAPCA)	9 Reg. offices	7 Regional offices	5 Reg. Opera. Administrations	12 Reg. offices
Local agencies	County Air Pollution Control Districts e.g., San Deigo APCD	City Health Departments	City/County Agencies, e.g., Chicago Dept. of Environ. Control	County Health Dept.	None	County Depart. of Health, Interstate Sanitation Commission	County Health Departments	Lane (County) Regional Air Pollution Authority	City/County Health Dept. e.g., Houston Dept. of Health
Other Related State agencies*	Air Poll. Hearing Board; Citizen's Advisory Committee	NR	Chicago Bldg. Insp., Advisory Environ. Control Comm. Appeals Bd.	State Dept of Health	RAPCA Liaison w/local Health Depts.	NR	State Dept. of Transportation and Commerce	NR	NR

NR - Not Reported
*Each air pollution control program relys on the State, County, or District Attorneys Office for legal support
Source: Nine State Agency Reports Prepared Under CEQ/EPA Contract. Listed in Table 1-1.

implements and enforces the Board's standards. A third agency, the Illinois Institute for Environmental Quality, is responsible for research and technological investigations.

The CEQ/EPA study focused its attention on the air pollution control programs in the city of Chicago. The Chicago Department of Environmental Control (CDEC) has been authorized to carry out many of the IEPA's functions within the city limits such as: permitting, surveillance, support engineering and enforcement for facilities with actual emissions of 100 tons or less. Enforcement decisions are made by either the CDEC commissioner or an Appeals Board, or the City Court.

New Jersey. The Department of Environmental Protection, through its Bureau of Air Pollution Control, has the responsibility for the development of standards, permit issuance, inspections, surveillance, technical services (e.g., stack tests), enforcement and special projects including toxics control, control of hazardous pollutants and emergency planning.

The Bureau has an interagency agreement with each of four Regional Air Pollution Control Agencies (RAPCAs): Elizabeth, Hudson Regional, Suburban and Central Jersey. Each RAPCA coordinates its activities with the local health departments to carry out local air pollution control ordinances. In addition, the Central Jersey RAPCA operates under a Health Advisory Board of Commissioners.

North Carolina. Rulemaking and appeals are the responsibility of the Environmental Management Commission. This Commission is advised by a smaller Air Quality Council. Another agency, the Department of Natural Resources and Community Development (DNRCD), implements the Commission's policies. Within the DNRCD, the Division of Environmental Management (DEM) administers the air quality program and conducts related research. There are seven regional offices responsible for monitoring, permitting, conducting inspections, and investigating complaints. Enforcement actions are initiated at the regional level and then approved by the DEM.

Texas. The Texas Air Control Board (TACB) has an independent Board that oversees the State air pollution control program. The divisions of the TACB are responsible for development of regulations, SIP preparation, permit issuance, air quality sampling, and handling appeals, enforcement and liaison with the State Attorney's Office. In the city of Houston, the Air Pollution Section of the city's Department of Health has been delegated the following program elements in the city limits: permit review, permit issuance for incinerators, annual inspections, 24-hour surveillance, complaint response and enforcement.

Connecticut. The State of Connecticut has a much less complex air pollution control organization. All functional responsibilities lie within the Department of Environmental Protection, primarily in the Office of Air Compliance. There are no regional offices; the Office handles all planning, engineering, monitoring and enforcement activities. Enforcement actions are handled by the Enforcement Control Center with a few cases being referred to the State Attorney General's Office for a court injunction or penalty.

Iowa. The Iowa Department of Environmental Quality is responsible for SIP and regulation development, enforcement, design review and permitting, continuous monitoring, and stack testing. Six regional offices are responsible for the malfunction reporting program and surveillance activities. The Regional offices are assisted by the State Department of Health.

New York. The New York State Department of Environmental Conservation administers air pollution control policies through the Division of Air Resources. The Division has seven bureaus--Electronics, Air Quality Surveillance, Source Control, Technical Services, Abatement Planning, Technology Development and Program Engineering--which provide assistance to nine regional offices. This study examined programs in Regions VIII and IX. The regions have permitting, surveillance, stack testing, fuel sampling and enforcement responsibilities. Initial enforcement actions are handled within the Regional offices. Litigation is handled by the State Attorney General's office.

Oregon. The Department of Environmental Quality has two major divisions that share the air pollution control responsibilities. The Air Quality Administration is responsible for planning and development, data aquisition, and operations management. The latter includes review of engineering designs, permit issuance and technical assistance at the request of the Regional Operations Administration (ROA). The ROA has five regional offices, each responsible for multimedia inspections, surveillance, drafting of permits and issuance of Notices of Violations. Further enforcement actions are undertaken by the headquarters office of the ROA.

2.3 Comparison of the Nine State Organizations

2.3.1 Delineation of Activities

In four States--California, Illinois, North Carolina and Texas--there are boards (councils or commissions) which oversee the operations of the State agencies. Air pollution control regulations and standards are developed by these oversight boards, and then implemented and enforced by line agencies. In the other five States, the regulations are developed, implemented and enforced under the jursidiction of the same State agency.

Although at a first glance, the delineation of activities among the various agencies seems straightforward, overlaps and confusion do exist. Even though the CEQ/EPA reports do not focus on the management and organizational relationships between the executive boards and State agencies, one problem in North Carolina is well-documented and indicative of the fact that such problems are significant. In North Carolina, the Environmental Management Commission must approve certain enforcement actions initiated by the Department of Environmental Management. This often causes delays in administering important actions, such as the issuance of consent orders.

The nine studies did focus on the State and local agencies and the operation of their complimentary air pollution control programs. At this level of government, it is interesting to compare the intra-agency relationship between the central and regional offices. For the most part, day-to-day regional operations are independent of the associated control office, although they function under a single body of regulations.

In Oregon, for instance, even though the Central Office of the Air Quality Administration enters into separate agreements with each of the regions, each of the agreements is different. The contractor reports that this fact combined with communications problems between the central office and regions make the agreements less effective than they could be. In both Oregon and Iowa, inspections and surveillance are principal functions of the regional offices.

In contrast, the regional offices of the New Jersey, New York and North Carolina agencies are responsible for operating the entire air pollution control program in their assigned jurisdiction. It is interesting to compare the operation of these latter three agencies. The four RAPCAs of New Jersey work closely with the central office, while New York's and North Carolina's regional offices function relatively independent of the central state agency office. In North Carolina, the contractor reports that although the comprehensive regional operation provides for agency and source rapport, it also creates inconsistencies among regions.

The two city agencies, Houston and Chicago, and the county agency of San Diego display similar characteristics of autonomy. California intended for its Air Pollution Control Districts to have full responsibility for stationary source control. The Chicago and Houston agencies function according to interagency agreements with the state agencies, but actual coordination between the city and state is minimal and causes inefficiences in the programs. In Houston, for instance, engineering design reviews are conducted by both the Texas Air Control Board (State) and the Houston Department of Health (City) for the same installation. Overlap also occurs in Chicago, where the Chicago Department of Environmental Control and the Illinois Environmental Protection Agency have divided jurisdiction so that the CDEC focus on minor sources within the city limits, and IEPA focus on major sources. However, the CDEC also inspects and initiates enforcement against any major source within the city where complaints or surveillance turn up suspected violations. As a result, duplication of enforcement activities has occurred in some instances when IEPA was not aware of CDEC actions.

2.3.2 Internal Organization

State and local agencies organize themselves in one of two schemes. The first is a functional organizational scheme in which agency functions for numerous environmental protection programs are grouped. This occurs in an agency that has for example, a permit review division that considers air, water and land pollutants prior to permit approval. The major problem that arises with this type of system is finding personnel qualified in all aspects of environmental pollution control. A more frequently adopted organizational scheme is one that is media-based, where air and water pollution control programs are administered separately. Here, the industries face conflicts (and possible delays) in having to deal with more than one division within an agency.

The Chicago and North Carolina agencies are the only two, of the nine agencies studied, that are functionally-based. North Carolina was just recently (1978) restructured as such. The remaining seven agencies are organized according to media. The Oregon staff indicated a slight diversion from the media-based orientation with their integrated inspections. In Oregon the field inspections are conducted for air, water and solid waste at the same time by the same inspector. The reports do not supply enough information to conclude which type of agency structure is most effective.

The San Diego report stated that one particular problem within the agency is the frequency of agency reorganization. Three reorganizations have occurred in the last decade, making it difficult to track agency activities and effectiveness.

2.3.3 Recordkeeping Practices

The efficiency of intra-agency operations are affected by recordkeeping practices. The Houston Department of Health (DOH), the agency responsible for stationary source air pollution control in Houston, has the only recordkeeping system reported to be "up-to-date, complete and effective". The DOH Computerized Source Investigation System provides information for each of the three major air program elements: surveillance, enforcement and permits. Table 2-2 displays the records that are kept for each program element, the purpose of the records and the type of information contained in the records.

Of the six agencies for which we have information on recordkeeping, none are reported to be efficient. The five agencies which computerize their permits data are the New York, Connecticut, Oregon, San Diego and Houston agencies. A problem that seems common to these systems is that the data is not used by, or integrated with, data from other groups (e.g., enforcement) within the agency. The North Carolina agency records enforcement, permit, surveillance and monitoring activities, and also has a county specific source file. Even so, the contractor reports that the records are highly decentralized, inconsistent, incomplete and poorly organized.

Table 2.2

TEXAS DEPARTMENT OF HEALTH RECORD KEEPING SUMMARY

Program	Records	Purpose	Type of Information
Permits	Permits Log	Tracks construction and operating permits	. Plant type . Date permit issued . NSPS applicability
	Incinerator Construction Plan Log	Tracks incinerator permits	. Location . Burn rate . Waste . Manufacturer
	Incinerator Card File	Tracks incinerator permit issuance and renewal	. Date of permit issuance and renewal
	SIS System	Tracks operating and construction permits	. Inspection date . compliance status . Sampling data
Surveillance	Complaint Log	Tracks resolution of citizen complaints	. Source of complaint . Type of complaint . Time and date of complaint . What action taken
	Upset Log	Tracks source upset conditions	. Nature and level of emissions . Control device affected . Date and time of notification . Expected duration
	Inspection Log	Tracks SIP inspection schedule	. Company . Date of inspection . Engineer and supervisor assigned to inspection
	SIS System	Tracks investigations, sampling, complaints, and upsets	. Inspection date . Sampling date . Complaint status . Upset violations
Enforcement	Legal Case Referral Log	Tracks case enforcement process	. Date of DCH case review . Date of referral to city legal department . Date of referral to county District Attorney . Disposition of case
	Active Company File	Provides list of files in master company file	. Complaints . Surveillance reports . Legal actions . Stack testing . Notices of violation
	SIS System	Tracks compliance status of all sources	. Date of investigation . Date of notice of violation . Compliance status . Date of next action

Source: "Preliminary Evaluation of the City of HOuston (Texas) Department of Health's Programs to Regulate Air Pollution from Stationary Sources", Booz-Allen, Inc. and PEDCo, June 1979.

Chapter 3. PERMIT SYSTEMS

The permit systems of the air pollution control agencies studied are a basic step in air pollution control. The permits systems are designed to: 1) identify and catalog sources, 2) detemine if proposed control equipment will meet emissions standards, 3) provide a legally enforceable document that requires the source to install the neccessary contol equipment and, 4) establish a means for periodic agency review of the source through permit renewal requirements.

The success of the permit systems has been, so far, in the success of the first three of these objectives which consititute initial compliance. However, permit systems have not been optimally employed to ensure continuous compliance. Only a few agencies have begun to add or to change operating conditions (for control or process equipment) at the time of permit renewal. Connecticut is the only agency studied that has begun adjusting permit renewal periods to compliance history. Permit systems can thus be modified to increase compliance among permitted sources.

Each of the State and local agencies studied has a permit system of some type for air pollution sources. This section compares State programs for permits to operate, permits to construct, permit renewals and variances. Table 3-1 outlines the principal features of the nine permit programs studied. A discussion of the effectiveness and problems related to the permit systems studied follows a procedural comparison of these systems.

Table 3-1. GENERAL CHARACTERISTICS OF THE NINE PERMIT SYSTEMS

CHARACTERISTICS	Chicago, Illinois	Connecticut	Houston Texas	Iowa	New Jersey	New York (Reg. XIII)	North Carolina	Oregon	San Diego, Calif.
Type of Permit Required:									
Permit to Construct (PTC)	Yes	Yes	Yes	Yes	Yes	Yes	Yes 3/	Yes 3/	Yes
Certificate to Operate (CTO)	Yes	Yes	Yes	No	Yes	Yes	Yes 3/	Yes 3/	Yes
Sources Requiring Permit(s) Existing	Yes	No	No	No	No	Yes	Yes	Yes	Yes
New & Modified	ALL SYSTEMS								
Sources Requiring Permit(s) Minor	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Major 1/	ALL SYSTEMS								
Number of Major Facilities 2/	406	255	249	390	3411	1316 4/	1033	331	121
Total Permits in Issuance	3000–4000	800	—	2770	41387 PTCs	7000	2900	2000	3096
Permits Issued Per Year	2400 PTCs 4000 CTOs (75% are fuel-burning permits)	150	129	-	6000 PTCs	250 PTCs 250 CTOs	726	46 new 125 reissued 40 modified	896 PTCs 818 CTOs
Renewal Period (Years)	5	2-5	1	Indefinite	5	1-3	3-5	1-10	1

1/ As defined by the particular State or local agency.
2/ CDS figures.
3/ Combined construction and operation permit issued.
4/ Statewide.

3.1 Sources Requiring a Permit

The definition of which sources are required to have a permit varies among the State and local agencies. Most agencies categorize "sources" as existing sources (those operating when the permit system began), modifications of existing sources, and new sources. The nine systems studied all require permits for new sources and modified sources. However, only Chicago, North Carolina, San Diego, and Oregon require permits for existing sources.

Source designation as "major", "minor" or "insignificant" is another characteristic that agencies use to distinguish between those sources requiring a permit and those that remain unpermitted Again, this designation varies among the agencies; although a "major" source is usually defined as a source capable of emitting >100 tons of pollutants per year, "insignificant" are usually domestic sources, and "minor" are those sources in between. Oregon supplements this general definition by specifying minor sources as those emitting between 25 tons and 100 tons of pollutants per year and "minimal" sources such as space heating oil boilers. In addition, Oregon issues special letter permits to 30 sources whose emissions are estimated to be near zero. All of the nine agencies permit "major" sources. Permits for "minor" sources are required in Connecticut, Oregon, North Carolina, Chicago and Houston.

3.2 Initial Permitting

For new sources, the first permit a source receives is a Permit to Construct (PTC). Following completion of construction, the source must obtain a certificate (or permit) to operate (CTO).

A flow chart of the typical permitting process followed by each of the States studied is presented in Figure 3-A.

In Iowa, the PTC is the only permit a source receives. [1] Oregon and North Carolina also issue single-permits, however they are designed as combined permits, permits to construct and operate. In contrast, the other systems--Chicago, Houston, San Diego, Connecticut, New Jersey, and New York--issue separate permits, Permits to Construction and Permits to Operate. In these six systems, the agency typically issues a PTC for one year.

The issuance of a PTC follows an engineering, or design review. These reviews are office evaluations of the proposed sources by a staff engineer who researches and calculates the emission potential of the control equipment. The engineers determine the conceptual soundness of the control approach, with a focus on the source's capability of attaining compliance on start-up, as opposed to sustained compliance throughout its useful life. Design reviewers usually do not consider continuous compliance. Typically, they do not, for instance consider materials of construction, replacement of parts, and monitoring of emissions and operating parameters. There are, however, two references to more comprehensive design reviews. Major sources in Iowa are "given thorough review" and permits are negotiated on a one-to-one basis in Oregon. Oregon also reported that the "more complex the source, the less time is given for thorough [design] review," since there are few qualified personnel to

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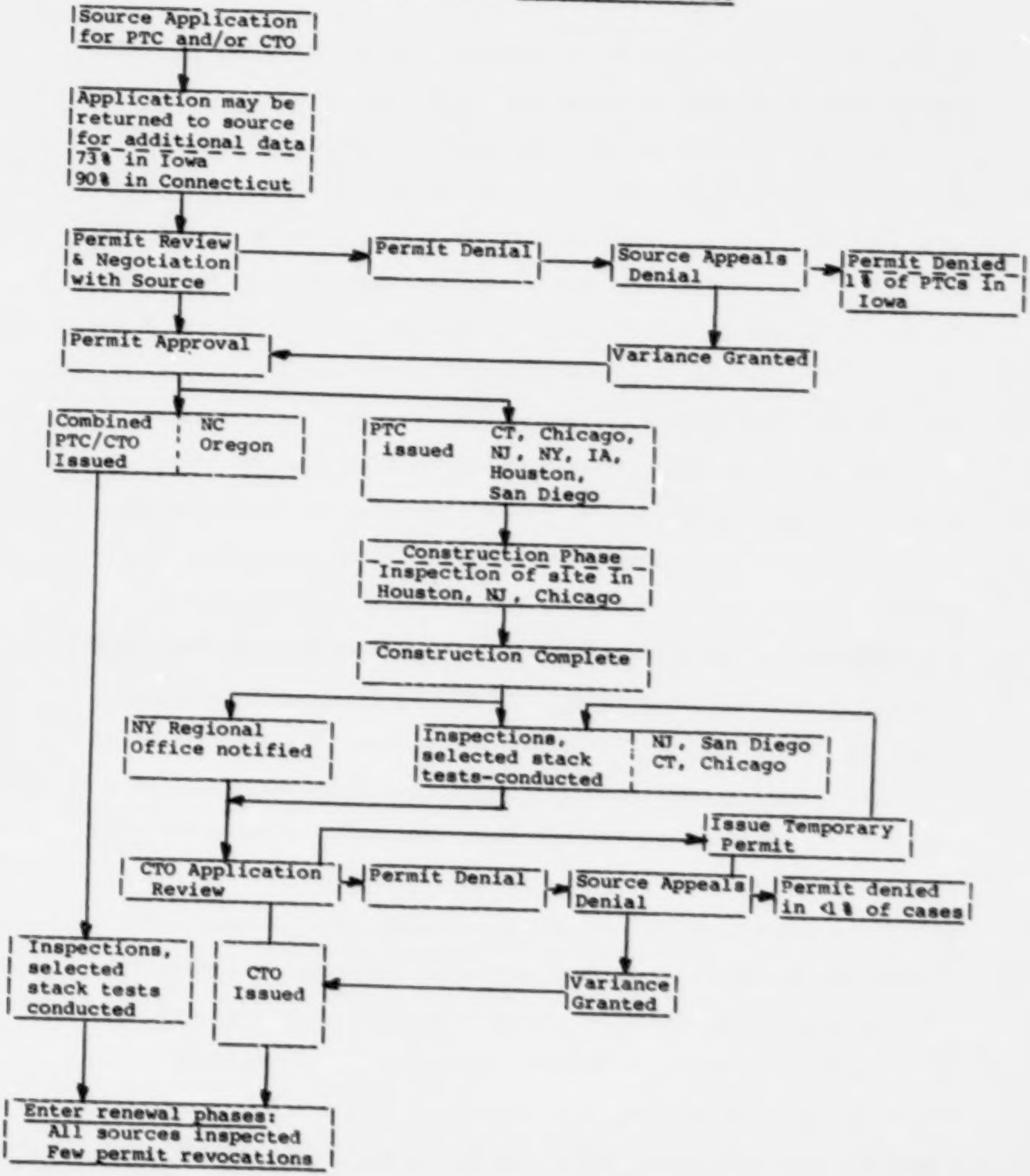
[1] As part of the SIP review process, Iowa is reviewing the potential of an operating permit program.

Figure 3-A. The Permit Process


Source Application for PTC and/or CTO
Application may be returned to source for additional data
73% in Iowa
90% in Connecticut
Permit Review & Negotiation with Source
Permit Denial
Source Appeals Denial
Permit Denied 1% of PTCs in Iowa
Permit Approval
Variance Granted
Combined PTC/CTO Issued
NC Oregon
PTC issued
CT, Chicago, NJ, NY, IA, Houston, San Diego
Construction Phase Inspection of site in Houston, NJ, Chicago
Construction Complete
NY Regional Office notified
Inspections, selected stack tests conducted
NJ, San Diego CT, Chicago
Issue Temporary Permit
CTO Application Review
Permit Denial
Source Appeals Denial
Permit denied in <1% of cases
Inspections, selected stack tests conducted
CTO Issued
Variance Granted
Enter renewal phases:
All sources inspected
Few permit revocations

conduct the many detailed reviews in the fixed time allowed.

The New Jersey report describes three reasons for shortened design reviews. The New Jersey experience is indicative of situations faced by the other agencies. First, the agency lacks the resources to review all applications in detail without making applicants wait months for the agency decision. Second, the evaluators have learned from experience what types of controls are adequate for various source types. And third, the burden of failure of proposed equipment to meet agency standards is on the source; that is, if a permit applicant maintains that the design of the equipment described in the application will satisfy relevant standards and the evaluator finds no blatant errors, the agency will give the source opportunity to construct the equipment and prove it is adequate.

In the review of permit applications, informal negotiations with the source are common, however, not all of the reports commented on this aspect of permit review. New Jersey did report that 33 percent of the PTC applicants are telephoned for additional information regarding their permit applications and many applicants request informal conferences for negotiation. Iowa, Connecticut, and North Carolina report, respectively, a 73 percent, 90 percent, and 80-90 percent return of permit applications to the source for additional information.

Aside from design review, agencies use two other ways of determining source compliance with emission standards as part of the permit systems:

- Three systems inspect the construction site.
- Six systems require inspections and/or stack tests for CTO compliance, after construction is complete.

In Houston, Texas, the City Department of Health (DOH) and the Texas Air Control Board (TACB) conduct a joint inspection of each site prior to construction to assure that the facility will not create a nuisance (there are no zoning laws in the city). The New Jersey Bureau of Air Pollution Control inspects construction sites of all sources affected by NSPS and NESHAPS. The Chicago Department of Environmental Control (CDEC) is the third system that inspects the construction site. The CDEC inspects during the construction phase to ensure that all equipment contained in the source's installation permit (equivalent to a PTC) is actually installed.

Since the remaining six agencies often issue the PTCs, on the basis of modelling and/or expected emissions from particular types of equipment, the agencies require inspections and stack tests for CTO approval or, in the some of the States, immediately after start-up. Tables 4-1 (p.47) and 4-2 (p.60) include agency-specific requirements regarding inspections and stack tests. Nearly all of the permitted sources are inspected for CTO approval, whereas only 3 agencies stack test all new majors and 3 agencies stack test <10% of the permitted sources. After the stack tests, inspections and public notice, the agency makes a final decision on issuing a CTO to the source. Table 3-2 summarizes the methodologies agencies use to determine compliance with CTO requirements.

Table 3-2. Methodologies Used to Determine Compliance with CTO Requirements

	Chicago, Illinois	Connecticut	Houston, Texas	Iowa[2]	New Jersey	New York (Regions VIII, IX)	North Carolina	Oregon	San Diego, California
Inspections	All sources[1] during construction	All sources	All sources	—	75% of CTO applicants	All sources	All sources	All sources	All sources
Stack Tests	Often required in CTO	6% of CTO applicants	All new sources	New major sources required to stack test after start-up	5% of sources	Common for large sources	7.5% of new sources	All new sources	All new incinerators. Most new metalurgical melting, sweating equipment and aggregate dryers

[1] "Sources" refers to permitted sources for the purpose of this table.

[2] No CTO is issued in Iowa, requirements listed are part of PTC.

Regardless of whether the source receives a PTC, or both a PTC and CTO, the permit may contain source-specific requirements. Table 3-3 identifies these by program. Note that many State/city agencies have the authority to place such requirements, or conditions, on a source, but in fact they rarely use the authority. Connecticut, Oregon and San Diego have begun to place operating conditions into permits. For instance, Connecticut is specifying the following operating parameters in their permit renewals: % sulfur, stack heights, scrubber flow rates, baghouse pressure drops, incineration temperatures, fuel rates and continuous monitoring. To date, nearly 1/2 of Connecticut's permits have such conditions.

Five of the nine programs studied have permit processing and approval fees. There is either a nominal charge; or in a few systems, there is a base fee plus a variable fee. The fees range from $25/source to $5000/source. This wide range of fees reflects the fact that two agencies set the fee according to source size, one agency sets the fee to cover the full agency cost of the permit review, and one agency combines the two variables in fee determination. Table 3-4 has specific, comparative data on permit fees.

There are two final characteristics of initial permitting that deserve recognition, and imply a questionable degree of permit effectiveness. The nine permit systems studied have an average of 1 percent permit denial. North Carolina denied 13 permits between 1974 and 1978, while it issued 2900 permits. Similarly, Connecticut denies an average of 1 permit/year while

Table 3-3. Source Requirements as Imposed by the Agencies

	Chicago, Illinois	Connecticut	Houston, Texas	Iowa	New Jersey	New York (Reg. XIII)	North Carolina	Oregon	San Diego California
Continuous Monitoring	Authority rarely used	Imposed thru reg.	Imposed thru reg.	Authority rarely used	Imposed thru reg. & permits	Authority rarely used	Imposed thru permit	Imposed thru reg. & permits	Imposed thru reg.
Record-keeping	Authority rarely used	Authority rarely used	—	Authority rarely used	No reqt.	Imposed thru reg.	Imposed thru permit	Imposed thru permit	—
Malfunction Reporting	Imposed thru permit	Imposed thru reg.	Imposed thru reg.	Imposed thru reg.	Not req'd.	Authority rarely used	—	Imposed thru permit	Imposed thru reg.
Operating Parameters	—	Imposed thru permit	—	—	—	Authority rarely used	—	Imposed thru permit	Imposed thru permit
Precautionary Measures (e.g. spare parts inventory	—	—	—	—	—	—	—	Imposed thru permit	—
O&M Reporting	—	—	Imposed thru reg.	—	—	Proposed	—	Imposed thru permit	—

KEY:

Authority rarely used: Agency has authority to require activity in individual permits, but rarely uses this authority.
Imposed thru regulation (reg.): For specific industries.
Imposed thru permit: In selected cases.
—: Not reported in 9 studies.
Proposed: Proposed plan in Agency.
Not req'd: Not required by Agency.

Table 3-4. AGENCY BUDGET, COSTS & FEES ASSOCIATED WITH THE NINE PERMIT SYSTEMS

	Chicago, Illinois	Connecticut	Houston, Texas	Iowa	New Jersey	New York (Reg. VIII)	North Carolina	Oregon	San Diego California
% Agency Budget	12%	6%	14%	15%	—	10%	14%	19%	—
Agency Cost/Source/Year	—	$360-480	$837	$390	$60	$90	$142	$125	—
Permit Fees	PTC $25/item CTO $5-50	None 2/	None 1/	None	$40-450 3/	$100 4/	None	$50-5050	$15- 578
Determining Characteristic of Fees	Source Size	—	—	—	Stack Diameter + Processing Costs	Standard Fee	—	Agency Costs	Source Size
Renewal Fee	Variable	—	—	—	$20	$10	—	Variable	Variable

1/ TACB.
2/ Presently developing fee system.
3/ $10.00 fee for painting of storage tanks.
4/ Certain major sources only.

issuing 150/year, and Iowa reports a 1 percent denial rate. San Diego, denied 42 CTO's while issuing 675 during FY 77/78. Finally, most systems grant permit(s) by default if and when the administering agency does not respond to source applications within a short designated time period, typically 30 to 90 days.

3.3 Permit Renewal

Although, as stated previously, the nine air quality control systems have no "O&M strategy" per se, the permit renewal process inherently provides for continuous compliance objectives. The renewable permit could serve as a means of imposing specific and adjustable conditions which must be met for compliance throughout the useful life of the source. The degree to which renewals are actually used in this manner depends on the following characteristics of each system:

- renewal frequency time interval
- source notification of renewal requirement
- detail of review prior to reissuance
- inspection requirements prior to reissuance
- conditions (types and specificity)

The time interval between initial permitting, the first renewal and subsequent renewals varies from 1-10 years; see Table 3-1 (p.23) for agency-specific renewal periods. The significance of the renewal interval is indicated in the Connecticut report which explains that the original 5 year renewal period was recognized as being too long to ensure proper O&M of some types of sources. Consequently, Connecticut currently issues permits on a 2-3 year basis, depending on the source's (and similar sources') history.

It is important to have periodic permit renewal so that agencies have an opportunity to review and, if necessary add requirements to source CTO's. Permit renewal requirements are typically stated in the initial permit. The New Jersey, Texas and San Diego agencies have active source notification programs prior to required renewal dates; and the Connecticut agency notifies sources after their permit has expired. The Connecticut report gave the only indication that sources not applying for renewals may present problems to the agencies; Connecticut is developing a fee system in which there will be a penalty for sources failing to renew. Other reports implied that renewal applications are not a problem. In New Jersey, for instance, sources fail to file for renewal only in "very rare occurrences."

Upon application for permit renewal, and before any permit is reissued, sources in five States must pay renewal fees; and administering agencies must conduct permit reviews and inspect the sources. In North Carolina, for example, the source is inspected, and then evaluated by the permits chief, technical services chief and air quality section chief. Even so, 89 percent of renewal requests in North Carolina are granted without stipulations for operations or maintenance.

Note that while inspections for initial permits are not always mandatory, inspections for permit renewals are mandatory in these nine permit systems.

Renewal application, permit review and inspection usually lead to granting of a renewal permit. Denials are rare as discussed above. In addition, once they issue operating permits, control agencies revoke very few of them. However, Chicago, North Carolina, Oregon and New York claim that although no revocations have yet occured, potential revocation is a real threat to the sources and a powerful enforcement tool.

It is also significant to recognize that although control agencies can alter permit requirements at the time of renewal, the permits generally remain the same unless process or regulations have changed. The only three agencies which have, as a practice, begun to add operating conditions during the permit renewal process are Oregon, Connecticut, and San Diego.

Hence, most agencies have an administrative procedure suited for O&M review. But, in general, the procedure does not appear to be used by most agencies to actually affect O&M, since few agencies impose O&M specifications in their permits.

3.4 Variances

The series of events in the initial permitting processes and the renewal systems previously described are representative of those instances in which a source accepts the permit and permit conditions. Obviously, there are instances in which the source disagrees with the permit conditions and seeks relief from them through variance, exemption or appeal.

Some air pollution control agencies have the authority to grant variances (or waivers) which, in effect, authorize non-compliance situations. In Illinois, sources may petition the Air Pollution Control Board for a variance. If the source proves that it will face unreasonable hardships in meeting regulatory requirements, the variance will be granted. Twenty-five to 30 variances are granted annually by the Illinois Environmental Protection Agency. In Region VIII of New York State, 50 variances have been issued out of 7000 operating permits. Texas DOH grants exemptions, in effect the same as variances, on a case-by-case basis. In the year June 1977-June 1978, 12 exemptions of this type were granted out of the 37 operating permits processed. Texas also exempts 93 source categories which are considered to be "insignificant" (e.g., incinerators emitting less than 100 lbs/hr of pollutants).

Sources can also appeal to the agencies if their permits are denied or revoked. The Chicago Agency allows a period of grace after CTO denial. In this time period, the source must install the necessary control equipment and is not subject to enforcement penalties unless the equipment is not installed or modified according to schedule.

Rather than deny a permit, two agencies (New Jersey and North Carolina) provide temporary CTOs. New Jersey issues temporary permits to sources who have completed construction, allowing them enough time to "debug" their control systems prior to inspections. The New Jersey agency then inspects the facility, and stack tests 75 percent of the newly completed sources. If the source is in compliance, the CTO is issued; if not in compliance, the temporary CTO is often extended. The North Carolina system provides short-term renewals to 10 percent of all renewal applications per year. These short-term permits are accompanied by requirements for corrective actions.

3.5 The Effectiveness of Permit Programs

EPA asked each of the contractors to evaluate the effectiveness of the permit program in each agency. Specific measures of effectiveness do not exist, according to the contractors. Even so, the contractors did attempt to describe how effectively the permit system presently functions. Generally speaking, the contractors felt that the permit systems are "effective" in getting stationary sources to comply with regulations at the start-up of their operations. The contractors also agreed that the systems could be even more effective if operation and maintenance of the control equipment was a criterion for design review and permit specifications.

GCA and TRC rated the permit programs by four criteria: technical feasibility, legal feasibility, administrative feasibility, and agency costs. GCA describes the ratings of program feasibility as "a highly subjective assessment, based on conversations with regional personnel." GCA and TRC present all of their ratings of effectiveness with this same caution. Their final evaluations describe the Connecticut program as "somewhat effective," (TRC); the Oregon program as "very effective, (TRC); the Iowa program as "moderately effective," (GCA); and the New York regional programs as "moderately effective," (GCA).

Booz Allen generally described the North Carolina permit system as a "well organized, well administered" program, and then pointed out a few problems with the system (see next section for problem descriptions). Texas is seen as placing stringent controls and requirements on new sources, but having a permit system which is administratively inefficient due to duplicative engineering evaluations by the TACB and DOH.

The Chicago system is described as effective, by Pacific Environmental Services, due to 95 percent of the total pollutants emitted being accounted for through permits. In regard to San Diego, PES commented that the APCD "has attained and implemented high level review criteria", but PES also points out the need for changes in the system.

The Environmental Law Institute does not comment directly on the effectiveness of the New Jersey process. ELI does, however, state that the New Jersey permit program is backed up by agressive enforcement.

3.6 Problems Associated With Operation of the Permit Systems

The nine reports mention problems specific to the permitting procedures of each State or local agency. Yet most of the problems are not unique to a single agency and fall into one of five major categories:

- o Source identification
- o Trends in permit loads that cause fluctuating workloads for permit reviewers
- o Routine nature of the permit review processes
- o Emphasis on initial compliance
- o Insufficient use and coordination of source information.

A first order problem with any of the permit systems is that uncontrolled air polluting sources may be operating without a required permit. One reason for this is that agencies have difficulty in identifying the number of emission points and the number of facilities that require permits. Agencies often identify sources through Department of Labor directories (which are often out-of-date), telephone books or by complaint follow-ups; however, they rely most heavily on voluntary source applications. This source identification problem is amplified by the fact that agencies do not take stringent enforcement actions against the sources that are "discovered" and have failed to apply for a required permit. Source identification differs in the Chicago system where all building permits are reviewed and tagged either as potential or insignificant sources of air pollution. The Chicago agency feels that this is a most effective means of source identification.

Trends in permit loads have also affected the effectiveness of the permit systems. Data from the first few operating years of each system indicate heavy workloads for the permit review staffs, particularly in the three States that require permits for existing sources. The San Diego report mentions that many existing sources were "grandfathered in" for this reason. Levels of permitting are also a function of changes in regulatory requirements. For instance, the San Diego APCD recently added authority to require that Federal facilities obtain permits to construct and to operate. The city estimates that the U.S. Navy alone will require 800 new permits. The North Carolina report indicates similar trends-permitting loads peaked in 1973 after which most new and existing sources had permits. A second "buldge" in 1975 reflects the statutory change extending permitting requirements to existing sources. These "start-up" permitting loads are to be expected; however, the loads can be eased with staggered renewals.

The heavy workload of the permit staffs, particularly in the peak periods described above, are a partial cause of the third problem associated with permits--the routine and cursory nature of the approval process. This is compounded by the lack of technical guidelines and industrial standards for use by reviewing engineers.

The inadequacy of design reviews has been discussed in section 3.2 (p. 24) entitled "Initial Permitting." One point worth reiterating here is that the focus of design reviews is on initial, rather than continuing compliance. Although most State agencies have the authority to impose O&M permit requirements, only three agencies have even begun to use this authority. Continuing compliance is more typically associated with the enforcement division(s) within the agencies, through their inspection and reporting authorities.

Another problem with the permit systems is the insufficient use of agency data. The permit program and the other programs of each agency do not effectively share information about sources. For instance, in initial permit review or the review of permits for renewal, the compliance history of similar sources and the source itself would be useful in the determination of permit requirements. Conversely, information from permit applications (including source location, size, types of processes, pollution controls and waste stream characterizations) should be coordinated with the Enforcement and Surveillance Divisions' tracking of source compliance status. To date, Connecticut, Houston, San Diego and Oregon have begun to computerize permits data for such purposes.

Chapter 4. INSPECTIONS, SURVEILLANCE AND ENFORCEMENT

The inspections, surveillance and enforcement functions of air pollution control agencies seek to ensure compliance with laws and regulations intended to secure environmental protection goals. While differences exist among the agencies studied, common functions and the normalizing influence of Federal law, Federal technical and management assistance, and Federal grant mechanisms have resulted in similar control operations. The general scheme is that sources are "permitted" (with or without formal permit mechanisms) to operate a process with pollution control equipment such that resulting emissions meet legal standards. Agencies conduct surveillance and inspections to monitor compliance status and undertake enforcement actions where violations are detected. Permitting has been discussed in the previous section. This section presents the findings of the contractor studies regarding organization for and performance of inspections, surveillance, and enforcement.

Air pollution control agencies must control a large number of sources with a limited number of personnel. This means that agencies and sources interact on an infrequent, short-duration basis, even for major sources. To achieve total control, constant surveillance of every source, would require unacceptable expenditures of public resources. For this reason, and as with traditional enforcement systems, agencies depend on voluntary compliance by the majority of sources, and substantial citizen participation in identifying violators.

At the State level, enforcement is complicated by manpower and resource constraints and conflicting jurisdiction with Federal entitites and local governments. While not discussed in this study, it is important to recognize that State enforcement of environmental strategies roughly parallels and "shadows" federal enforcement. In the field of air pollution, enforcement is further complicated by the lack of data upon which to make compliance determinations, and by uncertainty regarding just what constitutes compliance. These shortcomings arise from the still evolving nature of our understanding of pollution control technology and of the impact of source activities on ambient air quality.

Basically, there are two phases to enforcement. Initial compliance whereby sources must install required equipment, and continuing compliance whereby sources must meet legal requirements over time. The focus of our study was limited to sources which had at some time "demonstrated" initial compliance.

In the "continuous compliance" phase, surveillance, inspections, and enforcment become the primary agency functions. In addition to the enforcement and surveillance activities of the State agencies, legislatures have empowered agencies to impose requirements on sources to assist in ascertaining compliance status. Thus sources may be required to perform stack tests to determine initial compliance, or to stack test annually to demonstrate continued capability to meet emission standards. Similarly, when appropriate, sources may be required to monitor operating parameters and emissions and to keep records and/or report periodically to the responsible agency on compliance status. Most agencies studied prefer a cooperative/negotiative approach to enforcement, rather than the automatic impositions of sanctions when violations are detected.

Thus ensuring compliance will depend in large part upon the effective utilization of existing State enforcement mechanisms, and development of enhanced violation detection and resource management capability.

The next sections of this report describes the mechansisms agencies use for detecting violations, source self-surveillance requirements and agency response to violators.

4.1 Agency Detection of Violators

4.1.1 Inspections

Inspections are formalized and often-preplanned surveys of a source or facility. They fall between stack tests and surveillance in terms of accuracy of compliance determination and in terms of effort and expense required. This section will first describe model procedures for inspections. Then agency-specific inspection practices will be discussed.

For those agencies that issue operating permits to all of their significant sources, frequency of inspection is often tied to permit duration. Other agencies tie frequency of inspection to pollution potential criteria such as size, potential emissions, and compliance history. Inspections may be announced or unannounced but in either case they are usually anticipated by the source to be inspected. This is particularly the case for annual inspections at the time of permit expiration which are highly predictable. Inspections are also conducted in response to citizen complaints or a source's malfunction report.

The inspectors visit the site to identify the existence of excess emissions violations; and, if a violation exists, the inspector must verify the existence and extent of the violation. Inspectors are required to do far more than merely record perceptions, however. In some instances violations may be obvious; in others, the inspector may be required to analyze and interpret ambiguous data on indicia of non-compliance and then perform calculations to determine the extent of excess emissions. He often performs technical assistance functions and must be familiar with a variety of administrative duties including preparing notices of violation and documenting inspection activities. He must procure and protect evidence in a manner which preserves its utility for later enforcement action. In each of these areas, there are opportunities for error; and errors, whether occassional and inadvertant, or chronic due to inexperience and turnover among inspectors, decrease the credibility and effectiveness of the agency's enforcement efforts. High turnover among inspectors was a frequently cited problem in the agencies studied.

Agencies vary regarding staff experience levels, training requirements and opportunities, and the responsibilities which are imposed on field inspectors. Some agencies provide inspectors with source compliance histories and computer print-outs of emission points to be inspected. An inspector may be responsible for a single media and inspect a limited number of sources in one inspection; or he may be responsible for all media and spend the requisite time to inspect an entire facility as in Oregon. At least two agencies (Oregon and Chicago) assign inspectors with special expertise to inspect complex sources.

The following section discusses the number, types, tools and results of inspections for the 9 agencies studied. Table 4-1 summarizes agency inspection activities.

Table 4-1 INSPECTIONS

	CHICAGO	CONN.	HOUSTON TEXAS	IOWA	NEW JERSEY	N.Y. (REG.VIII)	N.C.	ORE.	SAN DIEGO CA.
Total Number of Inspections/Year	3000	1200	450(1978)	800-900	1900 1/	1800		1600	
Source Inspec. Frequency Majors:	Annual	Annual	Annual (88)	At least once/year	Annual 2/3/	Annual	Minimum of once/2yrs.[4]	400-2x /yr 5/ 600-1x/yr 1000-x1/ 5 yrs.	Annual
Minors:	Annual	Up to 1 per 3 years	Annual(25) Bi-ann. (350)		High risk 2x/per 5yr. CTO Low risk 1x/per 5 yr. CTO				
Preliminary Activities		Pre-inspn question-naires					Visible Emissions Evaluation	Review of files	Equipment list prepared
Post Inspection Activities	Report and Computer Compliance Checking	Premise Eval. Report		Consulta-tion Follow-up visit if required	Minor viol. conference to improve performance	County DOH Follow up on consent agreement	Report sent to source follow-up if req'd.		Inspec-tion report
Time Required				4 hr/source 15 hr/ facility	38 min. per source			Avg 3 hrs.	
Inspection Results				90% found in compliance	5% in viol (10% major violations)				

1/ 300 complaint inspections, 400 reported malfunction inspections.
2/ 2x/year if NSPS/NESHAPS apply to the source. Major sources with a RAPCA are inspected by the RAPCA in addition to the Bureau inspections listed in the table.
3/ 4x/year if troublesome.
4/ Each R.O. develops schedule aimed at quarterly/biannual/annual inspection depending on site, past performance.
5/ Source complexity determines inspection frequency.

Connecticut. Connecticut conducts scheduled inspections of major sources on an annual basis, and other sources at least once every 3 years. Approximately 1200 of the 5200 sources affected by the inspection program are inspected each year. Inspections are conducted by the Field Operations Group and are preceded by a Pre-inspection Questionnaire (PIQ) which provides the agency with detailed source data prior to the inspection. After the inspection the inspector files a "Premises Evaluation Report" which includes observations and comments.

As with all agencies, the Connecticut inspector is limited in the tools available for determining compliance status. He may conduct a visual emission observation of the plume, detect odors at residences or the property line, note the general cleanliness of source facilities and where possible observe operating parameters. The inspector may specifically request a stack test to determine compliance. As the study noted, "Determining compliance is frequently a complicated process that requires judgment and knowledge of that source."

The Agency has identified infrequency of inspections as a problem area and is intiating efforts to decrease inspection intervals. The study noted that in order to conduct more inspections, a greater number of personnel must be assigned to the task and/or more effective inspection methods must be found to reduce the time required per source.

In the past, multiple-permit facilities have been visited several different times within a brief period to check emission points with nearly coincident permit renewal dates. In an effort to simplify the inspection program and reduce such inefficiencies, the DEP has recently changed operations so that only the Field Operations Group conducts inspections. Historically, the Permits Group conducted inspections to ensure conformance with permit conditions and schedules.

Oregon. Inspections are conducted by the regional operations field offices and are viewed as a means of reminding sources of the requirement for compliance. The inspections are scheduled, but sources are not generally notified beforehand.

Source complexity determines frequency of inspection. Headquarters has engineers who are experts regarding specific industries. Based on formal written agreements with the regional offices these experts conduct some inspections of major complex sources.

Inspectors have multi-media responsibility (Air/Water/Solid Waste). Prior to visiting the sources, the inspector checks the files to get a perspective on compliance history - familiarity with process operations facilitates inspection.

Approximately 1600 inspections are scheduled per year with the average time for an inspection being 3 hours. Frequency of inspection for given sources was reported as follows.

400 Major Sources - inspected at least twice per year
600 Minor Sources - inspected at least once per year
1000 Minimal Sources - inspected once per 5 years

North Carolina. North Carolina's SIP requires inspection of all sources at least once every two years. Due to the burden this imposes on the agency, only a small number of sources this are inspected more than once per year. Each region annually develops a schedule which is intended to result in quarterly, biannual or annual inspections depending on size and past performance of the source.

Formal inspections are typically preceded by a visible emission evaluation (VEE). Inspector familiarity with sources reportedly allows identification of changes in operation and maintenance of control equipment. The inspector transmits a post-inspection report containing findings and sometimes recommendations, to the source operator. A follow-up inspection may be conducted if corrective action was recommended.

Table 4.1 summarizes North Carolina's inspection activities for 1973-1978.

New Jersey. Inspection frequency is a function of source size and pollution potential. Major sources, of which there are approximately 1200, are inspected annually by the Bureau's Technical Support Group and quarterly if within a RAPCA. Frequency of Bureau inspections was reported as follows:

NSPS/NESHAPS - Twice/yr
High Risk Minors - Twice/5yrs
Low Risk Minors - Once/5yrs (plus an ocasional RAPCA inspection)

In addition, inspections are conducted for approximately 75% of those sources with permits to construct before they are issued certificates to operate. Inspection time averages 38 min/ per point source. Bureau staff estimate that three quarters of all inspections are unannounced.

In 5% of inspections conducted, sources are found to be in violation; however only 10% of the violations are major. (70% are minor and 20% are determined to be non-violations). For minor violations the Bureau may conduct a conference to improve source performance - the source usually cooperates.

The Minor Source Support Group supervises the inspection for minor sources (e.g., gas stations, airports, marinas). In the period, Jan-Aug 1978 the group conducted approximately 550 inspections, mostly of gas stations (vapor recovery).

RAPCA supplementation of Bureau activities is substantial but appears to be weighted toward activities such as complaint inspections. In a recent year, 200 cases were referred to the Bureau for state action because they were too complex to handle at the local level or only involved violations of the State Code.

Iowa. The Central Office seeks to achieve and maintain consistency in inspection activities conducted by the 6 regional offices. At random times in the year, regional staff conduct annual, unannounced inspections.

Approximately 800-900 inspections are conducted annually. Major sources (which total 390) are inspected twice per year and minor sources in non-attainment areas are inspected once per year.

Inspections are described as reasonably thorough, and average 4 hours per source/15 hours per facility which includes preparation, travel and reporting. Approximately 98% of sources inspected are found to be in compliance.

More time is spent in cases of known violators and those plants that have monitoring devices or which maintain O&M records. Inspections occupy 50% of the time of the 9 regional inspectors. Non-compliance results in consultation between agency and sources and may result in a follow-up visit.

New York. Region IX inspects large sources once per year and "troublesome" sources up to four times per year. Regional staff claim to be aware of the continual violators and the most troublesome and recalcitrant sources. A computer printout of scheduled inspections facilitates administration. Approximately 1800 scheduled inspections are conducted per year (6 per day).

For self-reporting or complaints the inspector visits the site to evaluate the seriousness of the emissions. He has the power (never invoked) to order a shutdown. The offender may be placed under an order or may sign a consent agreement. The County is responsible for following-up.

San Diego, California. In conjunction with its annual permit program the APCD conducts unannounced (but predictable) inspections. 60 days prior to renewal a computer provides the inspector with a list of all equipment to be inspected. Advance notice may be provided for complex sources involving preparation and time-consuming visits. During the annual inspection, APCD inspectors try to observe the operation at normal load. If the source is operating under a variance, inspectors seek to ensure compliance with variance conditions.

Houston, Texas. Prior to commencement of construction, an engineering evaluation is performed as is a joint inspection by the Houston Department of Health and the Texas Air Control Board (TACB). The inspection verifies information submitted and determines whether the source may be a nuisance (Houston has no zoning ordinance). Recommendations are sent to TACB Headquarters in Austin.

Prior to issuance of an operating permit another joint inspection is conducted. This may involve opacity tests, a stack test, taking of property line samples or recording of process parameters.

The DOH announces and conducts annual SIP inspections for the 88 major sources within DOH's jurisdiction. 25 sources in the 25-100 ton range located in non-attainment areas are also inspected annually. The remaining 350 sources in the 25-100 ton range are inspected biannually. These inspections include review to ensure that process and control equipment are unchanged and that permit conditions are complied with. Data from sources which conduct self-monitoring or take their own property line samples are also reviewed but do not form the basis for an NOV if a violation is detected.

Chicago, Illinois. The Illinois Environmental Protection Agency (IEPA) and the Chicago Department of Environmental Control (CDEC) have an interagency agreement that technically limits CDEC to less than 100 ton per year facilities. Nevertheless, complaints and mobile inspector reports may trigger inspections and enforcement against larger sources.

Facilities are inspected at least once per year. Inspections occur about the same month every year and may be described as quasi-planned and unannounced (but again, anticipatable). Inspectors are aided by a computer list of emission points.

During the construction phase an inspection team is assigned to the site to confirm installation of equipment required in the permit. For industrial plants and large and complex fuel and solid waste burning facilities such as electric utilities, inspections are conducted by engineers from the Engineering Division. Other inspections are conducted by the Inspectional Services Division.

Following inspections, data is forwarded to the Engineering Services Department for review and entered in the CDEC computer to determine compliance status. A visible emissions review is conducted when deemed necessary by the inspector. The study reported that annual inspections are conducted for 35,000 pieces of fuel burning equipment, 3,000 incinerators and 3,000 industrial plants.

4.1.2 Surveillance

Surveillance encompasses the myriad of agency activities short of formal inspections. Surveillance may be of large geographic areas or specific sources. Activities typically include 'drive-by' or 'windshield' inspections, smoke readings and odor detection. In some agencies, surveillance activities include spot inspections in response to a complaint or after observations of a potential violation. Spot inspections are less detailed, less formal, and less costly than the inspections previously discussed (see Section 4.1.1). Surveillance activities serve to to assist in maintaining an agency presence, and are largely limited to observation of visible emissions or emissions which cause odors. Surveillance activities are conducted following source efforts to regain compliance after malfunctions, complaints or agency detection of violations.

Connecticut's surveillance program reportedly covers 200-400 sources per year (out of 13,000 in the state). The surveillance program consists of complaint response, drive-by's and NOV follow-up.

Surveillance activities in Oregon are conducted by the Regional Field Office. Of the 1000-1500 surveillance - type inspections conducted per year, most are random - basis drive-by's to detect visible/odor emissions. In addition to establishing an agency presence, such activities allow inspectors to become familiar with the "normal" appearance of sources. Nevertheless, detection of violations is dependent on obvious excursions.

Other limitations noted in the Oregon program, but not unique to that Agency, include inexperience and turnover of inspectors and the effect of geographic location on inspection frequency -- those sources in the Eastern and Southern parts of the state which are relatively distant from the Regional Office are checked less frequently.

The Iowa report lists spot inspections, complaint response drive-by's and compliance follow-up as elements of the state surveillance program. According to our contractor's report perhaps 10% of known violations are detected by an inspector and a somewhat smaller percentage results from citizens' complaints. The majority of excess emission reports are received from the sources themselves.

New York's region VIII describes surveillance activities as spot inspections that are the number two source of non-compliance discovery (second to citizen complaints). Such inspections are concentrated on sources known or suspected to be in non-compliance.

In Houston the city is divided into four areas. Major sources are observed on a daily basis by auto, boat and helicopter to detect gross visible/odor violations. Again such activities are seen as providing agency presence and fostering inspector familiarity with source appearance. Surveillance may be focused by complaints or upset/ maintenance self-reporting. It was noted in the Houston study that surveillance activity in relation to SO_2 and HC emissions is very limited compared to surveillance for particulates.

Houston's DOH may initiate Legal Surveillance to document additional violations of known problem sources. Legal surveillance may include activities such as taking of property line samples, (a practice apparently unique to Houston), reviewing records and photographing violations. Such surveillance may be used:

1. to secure additional evidence for possible case preparation;
2. before, during and after scheduled maintenance;
3. to verify abatement measures agreed to in informal conferences;
4. to monitor sources using toxic materials.

Chicago's CDEC maintains a fleet of over 20 vehicles used by mobile inspectors to conduct abatement patrols and respond to complaints, and has at times resorted to aerial surveillance. It is estimated that CDEC conducts continuous surveillance for over 3000 facilities. While CDEC 'spot-checks' major sources, it's primary focus is on smaller facilities.

4.1.3 Stack Tests

Stack testing is generally the most accurate method for determining compliance status of a source at any specific time. However, stack tests also result in increased financial and manpower costs, thus the requirement to conduct stack tests is imposed with some care.

Most agencies studied use stack tests to determine the initial compliance status of new major sources and occasionally of new minor sources. There is considerable variety regarding the use of stack tests for continuing compliance. Stack tests may be required by permit, regulation or substantial inspector suspicion. They may be required annually, periodically such as at each permit renewal, or strictly a one-time initial compliance determination. Major sources, particularly large powerplant utility boilers, may be required to stack test periodically. The requirement may arise annually or may be a condition of permit renewal. Stack tests may be source conducted with or without agency observers, or conducted by special agency teams.

Stack tests are most often conducted at source expense by consultants, sometimes with an agency observer present. All states studied have the capability to conduct tests, but some local agencies such as the Houston DOH must request state assistance if a government conducted stack test is desired. Such requirements may arise where sources repeatedly fail consultant tests or submit data of questionable validity, or where the compliance status of a source is brought into doubt in some other manner.

Results from stack tests may or may not be used in enforcement action, and failure of a test may result in sanctions or merely continued efforts by the source to achieve compliance. Quality of data varies from agency to agency and from test to test. Complexity of test methods and of source operations coupled with lack of familiarity by test conductors result in a significant percentage of inconclusive tests. (see New Jersey discussion, p. 64).

Some critics have suggested that sources be required to stack test at other than optimum or representative conditions to insure that compliance is possible under all operating regimes. State regulations studied appear to vary regarding stack test conditions (see Table 4.2), but even where such authority exists, it has not been widely used (see Oregon discussion, p. 62).

An apparent benefit of a periodic stack test, as with a periodic inspection program, are the maintenance steps etc., undertaken by the sources to ensure compliance during the test. Unfortunately, the infrequency and cost of formal stack testing limit the utility of such mechanisms in a continuous compliance context.

State practices regarding stack tests are described below.

Table 4-2 STACK TESTING

	CHICAGO ILL.	CONN.	HOUSTON TEXAS	IOWA	NEW JERSEY	N.Y. (Regions)	N.C.	ORE.	SAN DIEGO CA.
Type of Sources Affected	New/Major	New/Major		Significant	New/Modified		New/Major/ Problem	New/Major	Major Problem
Number of Source Tests/Year	Case-by-case	50-60		76	65	VIII-20 IX-16	75-100	100-200	TSP-49 NO_x-62
Frequency	As Needed	Majors 2-8 yr. Interval						As Needed	Majors--annually (if practicable) Other-As Needed
By Whom Conducted	Consultant (Agency observes and does some)	Source or consultant (State insp. Observer)	State Agency	Consultant	Consultant	50% Consultant 50% Agency	Consultant (Agency has capability)	90% source/ consultant 10%-Agency	Agency
Test Conditions		Normal conditions ("highest anticipated level of operation			Level specified in PTC	"Acceptable"	Agency may specify conditions	Max. rate tests for 20% of Sources	Normal condition
Results					10% rejected 25% indicate non-compliance			>75% found acceptable	

Connecticut. For new sources, Connecticut prefers stack tests over emission estimates unless DEP engineers are supplied with or are familiar with similar applications and effectiveness of particular process/control equipment combinations. 5-6% of initial applications require stack tests, including all major sources (greater than 100 tons/yr.) The DEP does not require tests as part of permit renewal as long as operations have remained constant.

Major sources are required to test at 2-8 year intervals. The test interval depends on the type of source, control equipment and percent emissions relative to allowed. Approximately 75% of the tests are for process particulate emissions for boilers; the remainder are for boiler NO_x.

Fifty to sixty stack tests are conducted every year by sources (or consultants) at source expense, and observed by a state inspector. Tests are conducted at "Normal Conditions" which are defined as the highest anticipated level of operation, using standard methodologies. Subsequent operation of equipment at higher rates than those existing during testing may place the equipment in violation unless the increased rates have been approved by the department. There have been no agency requests for tests under atypical conditions, nor do they have authority to make such requests. Prior to testing the source completes and submits an Intent to Test form containing:

- operating and control conditions
- process description

- sampling methods
- locations

Following results of the test the agency does not provide a formal declaration of compliance. Sources submitting unacceptable results must repeat the test until compliance is achieved.

Oregon. Oregon's DEQ views stack tests as serving several purposes:

- determine need for controls
- specify extent of controls
- determine efficiency of pollution control equipment
- update emissions inventories

Approximately 750 sources in the state are affected by stack test requirements. One hundred to two hundred are conducted per year -- of which 75 are onetime particulate tests and the remainder are routine tests as required by permits. All new sources and new pollution control equipment are tested. Portable asphalt plants are generally tested annually.

The agency can require that the source test at its own expense. In-house capability consists of 2 engineers who are assigned to testing-the agency conducts approximately 10% of the tests. Failure results in a requirement for a retest. Repeated failure results in negotiation of a compliance schedule. Greater than 75% of the tests are found acceptable.

The agency uses a book of source test methods developed by EPA and the state. If methods are not available, the state and sources try to develop special test procedures.

Maximum Rate Testing is sometimes requested for one-time tests. About 150 of the 750 affected sources in the state have performed tests at maximum production and steaming rates.

North Carolina. North Carolina does not rely heavily upon stack tests for initial compliance determiniation. In the period April 1977- April 1978 compliance determinations were made as follows.

Engineering Evaluation -	67.5%
Visible Emissions Eval. (VEE)	25.0%
Source Test (ST) -	7.5%

In any event, an engineering evaluation usually accompanies stack tests or visible emission evaluations.

The State has the capability to conduct tests, but sources generally hire consulting firms to conduct tests and prepare reports. A member of the source testing unit usually observes.

Seventy-five to one hundred tests are conducted per year to determine continuing compliance. Regional staff identify troublesome sources at the first of the year and request support from the source test group. Negotiation results in establishment of testing schedules. The source test group has limited ability to provide requested support. As a result, some source tests are postponed a year.

If a source fails the test, a second consulting firm may be hired or the agency conducts the test. If the agency conducts the test, it is preceded by a pretest survey to determine the equipment and technical preparation required.

For repeated failure, the agency notifies the source by letter which requests that the source submit a control plan and compliance schedule within 30-60 days. Agency staff assist the source in plan development.

Chicago. Stack tests are required as conditions in construction permits or to obtain variances. Test requirements are imposed on a case-by-case basis, most frequently for borderline and questionable compliance cases. The IEPA stack test group witnesses tests conducted by sources and in a few instances conducts tests (none in Chicago). The CDEC has two test teams which either observe or, on a case-by-case basis, conduct stack tests. In case of failure, sources generally petition for a variance.

New Jersey. New Jersey may require a stack test for new or altered sources before issuance of a permanent (5 yr.) CTO. For standard processes and well-established methods for meeting standards a stack test is not required. About 5 percent of permit applicants are required to test, although future increase are expected due to NSPS and NESHAPS. General requirements and specific need for stack tests are imposed by the Permits and Certificate Section.

Test results are certified by a licensed professional engineer. When possible, the test is observed by a stack test evaluator and a field inspector (in order to ensure production at the level specified in the PTC and that correct testing techniques are followed). In 75 percent of current cases, the field inspector performs both functions.

Table 4-3 NEW JERSEY'S STACK TEST PROGRAM

1976 - 1978

Year	Source Operations Tested	Finding of Compliance	Finding of Non-Compliance	Inconclusive
1976	45	23	8	14
1977	29	18	9	2
1978 (through September)	32	4	3	25
TOTAL	106	45	20	41

Source: "The Response to State and Local Regulations on Emissions To The Atmosphere", The Environmental Law Institute, 1978.

The N.J. DEP reports that a greater than 67 percent compliance rate is reported, although the study also mentioned a high rate of inconclusiveness in current testing (see Table 4.3). Seventy-five to eighty percent of the source conducted tests are not performed in strict accordance with approved testing methods although errors are generally minor in nature. The DEP rejects ten percent of the tests due to improper technique.

The DEP requires three tests for determination of compliance. If any test indicates more than 10 percent above the standard, the 5 year CTO is not issued. The Technical Service section personnel criticized the lack of quality control standard on independent labs analyzing the sample.

San Diego, California. All major sources are source tested annually "if practicable." Others are tested on a priority basis determined by the magnitude and frequency of noncompliance. The San Diego APCD requires a test if it is economically and technically feasible or if emissions are not readily observable (e.g. NOX, HC, small particulate) and borderline compliance is suspected. A Visible Emissions Observation may suffice if the source is well within limits. Table 4-4 summarizes APCD activities conducted by the district's two Source Test Teams.

Iowa. The Iowa DEQ usually requires source tests for significant new and major sources shortly after the start of operations. DEQ may also require existing sources, usually suspected violators and marginal control equipment facilities,

Table 4-4 SOURCE TESTS PERFORMED BY THE SAN DIEGO APCD SINCE 1968

Fiscal Year[a]	Particulate	NO_x	Other
Prior to fiscal year 1975-1976	15[b]		
fiscal year 1975-1976	18	29	10
fiscal year 1976-1977	41	34	3
fiscal year 1977-1978	49	62	1
Total	123	125	14
Grand Total	262		

[a] Fiscal years are from July 1 to June 30

[b] Estimated

Source: "Description of the Regulatory Process for the San Diego, California Case Study, "Pacific Environmental Services, Inc., 1979.

to demonstrate compliance by stack tests. In 1977 DEQ personnel observed 76 source tests. DEQ may, in some instances, have a contractor conduct a test at the State's expense.

Failure results in a retest or development of an emission reduction program. Repeated failure results in a negotiated agreement to modify operations or install new equipment.

New York. Region VIII devotes approximately 30% of its available resources to conducting 20 tests per year. Region IX devotes 12% to conducting 16/yr. and reviewing some 20 tests conducted by sources. The Commissioner is empowered to require sources to conduct an acceptable stack test and submit a report. This gives the agency some flexibility in specifying test conditions.

4.1.4 Complaints

Limited agency manpower and resources, limited use of source self-monitoring, and geographic dispersion of sources, force all agencies studied to rely heavily on citizen complaints to assist in detection of emissions violations. Furthermore, many sources are reportedly sensitive to community reputation and take measures to stay in compliance which forestall citizen complaints.

Agencies such as the Iowa DEO characterize citizen complaints as "extremely important" in their enforcement framework. Further, several agencies place a premium upon timely responses to complaints, e.g., average response time is 36.2 minutes in Chicago and 15 minutes in Houston.

Agencies respond to citizen complaints in a variety of ways. Most provide an immediate inspection. If a violation is established, an NOV is issued if the emissions are substantial and continuing. In the instance of chronic malfunction cases and for sources with repeated complaints, agencies may escalate surveillance pressure on sources to ensure compliance.

The most severe limitation on the use of citizens as a surveillance force is their dependence on the physical senses. Those emissions which are not visible or which do not result in a discernible odor will not be detected. Table 4-5 lists average yearly complaint receipt, and a percentage breakdown of causes of complaints.

Table 4-5 COMPLAINTS

	CHICAGO ILL.	CONN.	HOUSTON TEXAS	IOWA	NEW JERSEY	N.Y. (REG.VIII)	N.C.	ORE.	SAN DIEGO CA.
Number Received/Yr.	2500[1]	1000	—	300	Bureau- 2700/Yr. CJRAPCA- 1600/Yr.	—	500	1000	
BASIS OF COMPLAINT:									
Smoke	40%	50%	14%		11%				
Noise	40%								
Odor	20%	>50%	61%		76%				
Dust			19%		9%				
Response Time to Complaints	36.2 Min.		15 Min.						
Time Spent on Complaint Investigation	Complete Inspec-	1 to 2 Days						4 Hours	

1/ Projected

Connecticut. Connecticut receives about 1000 complaints per year, mostly during the warm months. 1-2 days are spent on an average complaint, more than 50% of which are odor related, the rest being for visible emissions. Many of the complaints lodged in a given year involve more than 1 against a particular source.

Oregon. In 1977 Oregon recorded about 1000 complaint inspections. Inspectors spent about 4 hours per complaint including time for administration, telephoning, record keeping and follow-up surveillance.

North Carolina. In North Carolina, Headquarters receives complaints and sends a 'Request for Action to be Taken' to the appropriate Regional Air Quality Engineer. A staff member is assigned to conduct an investigation. Visible emission evaluations for smoke and odor are sometimes supplemented by plant inspections and interviews. Both complainants and sources are notified of findings and recommendations and follow-up is provided to determine compliance. In 1977, 538 complaints were handled and in 1978, 455.

New Jersey. New Jersey's Bureau receives approximately 2700 complaints per year. Seventy-nine % are received by phone during regular office hours. The Regional Air Pollution Control Association reportedly receives far more complaints - 1 RAPCA received 1600. The CJRAPCA indicated that many complaints were received during evenings and on weekends and holidays.

Houston. Houston reportedly has the capability to respond to complaints anywhere in the city within 15 minutes. Upon verification of a violation, DOH issues a NOV and the source is requested to take abatement action. The agency conducts increased surveillance for several weeks thereafter. The state tracks DOH progress in handling problems. Complaints received for a recent year were as follows:

Odor - 61%
Dust - 19%
Smoke - 14%
Other - 6%

In 1972, 222 complaints out of 1986 received resulted in issuance of an NOV.

Chicago. Chicago projected 2500 complaints for 1978, including 40% for noise and 20% for odor. In 1978, the agencies response time to a citizens complaint decreased from 57 minutes to 36.2 minutes. Inspectors conduct a complete source inspection upon arrival at the site.

4.2 Source Self Surveillance

The technological and resource limitations on Agency surveillance capability coupled with the substantial pollution potential of certain sources have resulted in laws and regulations requiring sources to assist in monitoring their own compliance status.

Agencies may require sources to report malfunctions, to install continuous monitors, to report periodically on performance; or to keep records of excess emissions, routine maintenance, operating parameters or other indicia of performance. These requirements may add substantial cost to source operations and may overwhelm data handling capabilities of agencies. For these reasons as well as a perception of undeveloped technology, most agencies have used the requirements sparingly. Nevertheless, the need to ensure continuing compliance and to allocate responsibilities in a cost-effective manner between sources and agencies is revealed in a trend toward greater use of these requirements.

Requirements such as recording of operating parameters and self-surveillance requirements are usually contained in general source category regulations. Nevertheless, they are sometimes included in the initial permits and may be added in permit renewals as requirements change or source behavior warrants. Oregon, for instance has attempted to negotiate these types of requirements in their operating permits. Sanctions are usually provided for failure to monitor, failure to perform maintenance on monitoring equipment or failure to submit required reports; however, the results of the studies indicate that such sanctions are rarely imposed.

4.2.1 Continuous Monitoring

The most highly developed and most frequently utilized monitors are for opacity. Continuous emission monitors (CEM), as with any sensitive instrumentation, require calibration and maintenance which is not always properly conducted. With the possible exception of utilities, sources and agency have criticized CEM's for inaccuracy, even for the relatively well-developed opacity monitors. See, for example, Connecticut, Iowa and Chicago discussions.

States have imposed CEM requirements on a small number of major sources, often in response to Federal requirements. Reporting may be required on a monthly or quarterly basis. To date CEM data by itself has not played a major role in enforcement actions or sanction impositions. A number of agencies have for a limited number of cases imposed requirements to monitor operating parameters such as pH, temperature and pressure.

As technology improves and expected cost reductions are achieved, CEM's should receive wider use. Such devices both alone and in conjunction with parameter monitoring equipment will play an important role in successful implementation of regulatory reform efforts such as the bubble and controlled trading, and in achievement of continuous compliance objectives. These efforts will be successful only if agencies have the means to quickly and accurately determine sources' compliance status.

Table 4.6 summarizes the agencies continuous monitoring requirements of the nine agencies studies. The remainder of this section describes the agency-specific requirements.

Table 4.6

CONTINUOUS MONITORING REQUIRMENTS

	CHICAGO ILL.	CONN.	HOUSTON TEXAS	IOWA	NEW JERSEY	N.Y. (REG.VIII)	N.C.	ORE.	SAN DIEGO CA.
Number of Sources Required to have Monitors		2050	50	41		23	20-25	100	
Characteristics of Sources Affected (Type and Size)	NSPS Source Category[1]	Fuel Burning Sources > 5 mm BTU/HR		Coal-Fired Boilers; Troublesome Sources Cement Plants >250mm BTU/HR; selected NOx and SO_2 sources	Fuel Burning Kilns, Sulfur Recovery, NSPS Sources	Fuel Burning Cements Acid Plants	Fuel Burning Sources >250mm BTU/HR	Specific Industr. Category	Major Power-Plant Boiler Stacks
Types of Monitors Required		Opacity		Opacity		Opacity SO_2, NO_x	Opacity	Specialized	Opacity & NO_x Some Specialized
Reporting Requirement		Quarterly (By 50 Major Facilities)		Quarterly			Quarterly for Excesses	Monthly	

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[1] Imposed by State Agency - IEPA

Connecticut. Connecticut's continuous monitoring regulation requires opacity detectors on fuel burning sources larger than 5 million BTU/Hr. heat input and sources burning using #4-6 oil or coal. A quarterly reporting requirement is also imposed for sources larger than 250 million BTU/Hr. This affects some 50 major utilities. Sources greater than 5 million BTU/Hr. are required to maintain records for inspection. HC and SO_2 sources are not included.

Field Operations Group personnel check the monitor during scheduled and spot inspections to:

- verify monitor location
- review strip chart data
- check chart readings against visible emissions observations

NOV's may be initiated for violations. Accuracy of data is a problem for Connecticut as it is for most of the agencies studied. The study reported poor quality of data except for the utilities.

Oregon. Continuous monitoring requirements are imposed on specific industrial categories such as Kraft pulp and sulfite mills, primary aluminum, and wigwam waste burners. Out of 1000 sources affected by these requirements, approximately 100 sources are selected to monitor emissions and at least one process parameter continuously. Control devices such as afterburners and scrubbers are continuously monitored and temperature and pressure parameters are recorded. Raw data must be available for review, and summary reports are submitted monthly to designated agency personnel.

For many of the selected sources CEM requirements are included in their permits, while the other sources' monitoring requirements are contained in NSPS standards. For some sources in the state, CEM's have reportedly helped to reduce the number of upsets and reduced the detection and correction time for malfunctions.

Oregon also utilizes "continual monitoring" - a hybrid between stack testing and continuous monitoring. Modified stack tests are performed periodically and monthly reports are furnished to the agency. Agency personnel are not present during these more frequent "continual monitoring" tests. The agency has found it feasible to enforce only against chronic violators reporting under the continual monitoring provisions. Nevertheless, our contractor deemed continual monitoring to be an effective continuous compliance/O&M evaluation tool.

North Carolina. North Carolina requires 20-25 sources to have continuous emission monitors.

Included in the group of sources are Wood/fossil fuel combination units greater than 250 million BTU/Hr heat input which are required to install visible emission detectors and recorders. Excess emissions must be reported quarterly with an explanation of nature and cause.

Sources emitting SO_2 have the options of installing a continuous monitor, conducting fuel analysis, or undertaking other procedures approved by the Agency Director. If fuel analysis is selected, sources must report quantity, type, BTU content, % S, and total calculated emissions (if in excess of standards). CM reporting must include emission rate and total SO_2 emissions (if in excess of standards).

New Jersey. Continuous monitoring in New Jersey is characterized as playing a relatively minor role in violation detection. CM requirements have been imposed on the following type of sources:

- sulfur recovery plants
- non-commercial fuel burning sources
- sulfuric acid plants
- certain NSPS sources
- rotary kilns (opacity)
- utility boilers (opacity)

Iowa. Iowa requires opacity monitors for all coal-fired boilers greater than 250 (10^6) BTU/Hr. Forty-one plants in the state are affected by the requirement; however, only 12 utility plants were reporting data at the time of the study. The Agency Director may require monitors on any coal-fired unit if warranted by compliance history, operation history and ambient air quality. Due to past performance, the Agency required two cement plants to install recording ammeters on their electrostatic precipitators. Recordkeeping and reporting are also required.

The State agency has the authority to require SO_2 monitoring sulfuric acid plants, although there are no such sources in the state. SO_x monitoring is required for some coal-fired boilers.

The technical feasibility of stack opacity monitors has been questioned by some Agency personnel due to a poor correlation between monitor readings and visual opacity determinations in certain cases.

San Diego. San Diego's continuous monitoring requirements are partially adapted from federal NSPS/NESHAPS requirements. They include specially designed requirements, such as pH monitoring, promulgated by the APCD to apply to specific sources. CM requirements are sometimes included as a permit condition.

After 6 October 1978 major powerplant boiler stacks must operate NO_x monitors and reflected light beam opacity meters with continuous strip chart recorders. These devices must be electronically checked daily and must be routinely maintained. CM results are admissible in judicial proceedings.

New York. Region IX has 20 source with continuous opacity monitors and 3 sources with SO_2 monitors. Continuous stack self monitoring is required for smoke and NO_x for fuel burning sources greater than 250 (10^6) BTU/Hr. According to the contractor, the Agency presently has much greater authority than it exercises. A Portland Cement plant has a CM for particulates (and record-keeping) and a mineral acid plant has a CM and sampling requirement.

Houston. Approximately 20% of major sources are required to perform in-stack monitoring. Approximately 30% take property line samples for their own use.

Data is reviewed but the Houston Department of Health (DOH) usually does not issue an NOV based on source supplied data. DOH instead performs an opacity test or requests the TACB to perform a stack test.

Chicago. Illinois Environmental Protection Agency (IEPA) has the authority to require self-monitoring by stationary sources, but except for cases where Federal NSPS regulations require CM's for specific source categories, this authority is not applied. IEPA reports that its experience has been that these types of records do not support a violation in court and are of little enforcement value. Nevertheless the contractor reports that IEPA intends to require these devices as technology in the CM field improves.

4.2.2 Malfunction Reporting

Sources must take the necessary preventive and corrective actions to minimize the possibility of malfunctions and to minimize excess emissions and environmental harm when unavoidable malfunctions occur. Malfunction reporting serves an important function in furthering these goals.

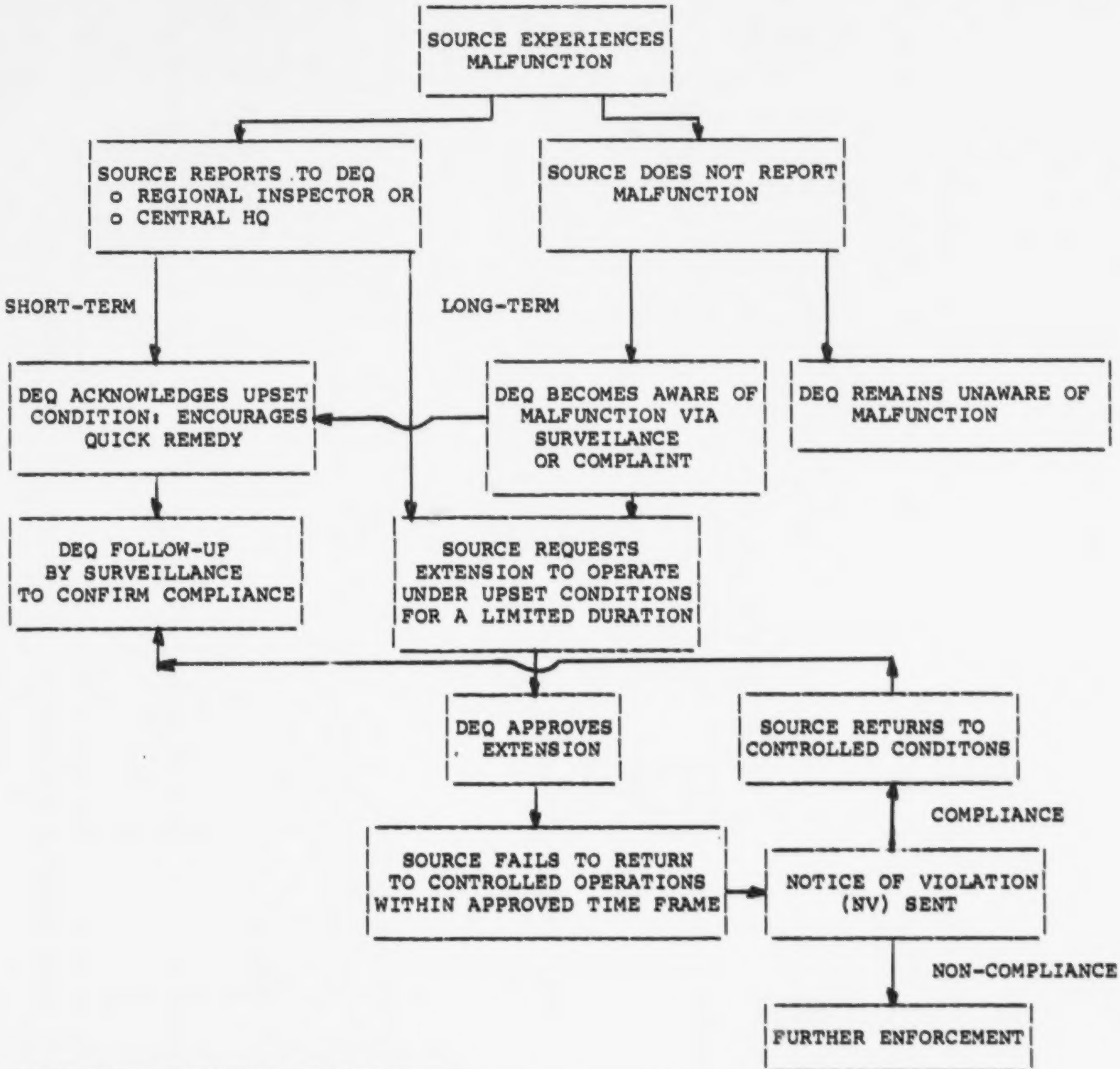
Sources may be required to keep records of malfunctions and/or provide timely reports of malfunctions to appropriate agency personnel. Such reports are important to regulatory agencies in determining actual emission levels, source performance, and effectiveness of various process/pollution control equipment combinations. Collecting and analyzing malfunction reports can reveal trends and facilitate technical assistance.

Malfunction reporting requirements typically require information on the incidents -- cause, duration, and the remedial action taken or planned. Reports of control equipment maintenance may also be required. Sources with repeated malfunction reports can be subjected to increased scrutiny and possibly sanctions, as repeated malfunctions reduce the credibility of claims of unavoidability. Meaningful sanctions are needed for failure to report malfunctions and failure to complete timely repairs.

The states studied vary in malfunction reporting requirements and agency response to such reports, as described in detail below. Generally speaking, variations occur in type of malfunctions which trigger reporting, time within which reports must be provided, and contents of required reports. By and large, agencies ensure the receipt of timely malfunction reports maintaining that excesses do not constitute a violation if reported within applicable time limits.

Figure B, taken from the Oregon report, provides a flow chart of a representative malfunction reporting system, and Table 4.7 summarizes the malfunction reporting requirements of the agencies studied.

Figure B. MALFUNCTION REPORTING


SOURCE EXPERIENCES MALFUNCTION
SOURCE REPORTS TO DEQ o REGIONAL INSPECTOR OR o CENTRAL HQ
SOURCE DOES NOT REPORT MALFUNCTION
SHORT-TERM
LONG-TERM
DEQ ACKNOWLEDGES UPSET CONDITION: ENCOURAGES QUICK REMEDY
DEQ BECOMES AWARE OF MALFUNCTION VIA SURVEILANCE OR COMPLAINT
DEQ REMAINS UNAWARE OF MALFUNCTION
DEQ FOLLOW-UP BY SURVEILLANCE TO CONFIRM COMPLIANCE
SOURCE REQUESTS EXTENSION TO OPERATE UNDER UPSET CONDITIONS FOR A LIMITED DURATION
DEQ APPROVES EXTENSION
SOURCE RETURNS TO CONTROLLED CONDITONS
COMPLIANCE
SOURCE FAILS TO RETURN TO CONTROLLED OPERATIONS WITHIN APPROVED TIME FRAME
NOTICE OF VIOLATION (NV) SENT
NON-COMPLIANCE
FURTHER ENFORCEMENT

MALFUNCTION REPORTING REQUIREMENT:
SOURCE MUST REPORT UPSET WITHIN 1 HOUR OF OCCURRENCE

Source: "Excess Emission Program - Final Task C Report for Oregon Department of Environmental Quality, TRC, 1979.

Table 4-7

MALFUNCTION REPORTING REQUIREMENTS (for Emissions Exceeding Standards)

	CHICAGO ILL.	CONN.	HOUSTON TEXAS (TACB)	IOWA	NEW JERSEY *(RAPCA)	N.Y. (REG.VIII)	N.C.	ORE.	SAN DIEGO (CA)
NUMBER OF REPORTS Received/Year				500	1287	700		250-300	
Reporting Required for		Excess emissions >72 hr. expected duration	Upset (if excess emission results) & Maint.	Upsets	Upsets (RAPCA)[1]	Upsets	Upsets	Upsets & & Sched. Maint.	
Content		Cause, Duration, Remedial Action, Pertinent Info		Cause, Remedy, Schedule			Nature Cause		
Timing: Sources Must Report	Notify Agency immediately by telegram	"Promptly"	10 days prior to maint. & ASAP for upset	Next working day	"Promptly" (24 hrs.) (RAPCA)		Quarterly	Sched. maint. (24 hrs. prior) to Malf.	24 hrs prior to maint. 1 hr after upset
Agency Response	Source req'd. to: comply w/instructions; Maintain records	Nov, State Order, or cease and desist order	TACB may inspect exemption request	Conference (informal)	Excused if RAPCA conditions met	Submission of maint. log sheets		Excused if timely report; follow-up surveillance; extension request if >48 hr.	
Sanction for failure to report?				No				"Little or no enf. action..."	

---

[1] N.J. Department of Environmental Protection has no malfuction reporting requirments.

Connecticut. In Connecticut, a source which experiences, or is expected to experience, excess emissions for more than 72 hours must report the situation to the Commissioner "promptly." The source must report cause, duration, remedial action (taken or planned), and other pertinent information. An NOV documenting the malfunction is issued in all cases. If the malfunction is prolonged a State Order is issued and a schedule is established. The Commissioner has authority to issue a Cease and Desist Order if the excess emissions threaten imminent and substantial damage to the environment. A hearing on such orders must be held within 10 days.

Oregon. In Oregon, scheduled maintenance must be reported to the DEQ within 24 hours prior to planned shutdown. Malfunction of control or related facility equipment resulting in a violation of standards must be reported within one hour of occurrence. If duration greater than 48 hours is expected, an extension must be requested from the DEQ director. There is no record of extension request denial.

Excess emissions do not constitute a violation if reported within specified time limits. Follow-up surveillance may be conducted if the malfunction is deemed "important", that is large scale or long duration emissions, proximity to population centers, and political sensitivity. Approximately 10 permits require spare parts and back up controls aimed at reducing occurrence of malfunctions.

The DEQ receives 250-300 reports per year, requiring 5-6 hours of agency time for source contact, documentation and follow-up inspection. DEQ regulations assign malfunction reporting to specific industry categories and are imposed based on source size and location. The study noted "little to no enforcement action if source does not report an upset."

New Jersey. Upset/malfunction reporting is not required by the New Jersey Bureau of Air Pollution Control. The Bureau recognizes allowances for start-up/shutdown, clean-up periods, break-downs and accidential releases as specified in the regulations. Thus most violations are not excused and the Bureau receives few voluntary reports.

Many RAPCA's, on the other hand, officially forgive O&M violations that are promptly reported. The Central Jersey (CJ) RAPCA received 1287 reports of possible upsets in 1977. For the CJRAPCA excess emissions are forgiven if:

- reported within 24 hours
- prompt repairs initiated
- no threat to public health
- infrequent occurence if a mechanical breakdown

In cases of State/local conflict, the CJRAPCA applies local law and the Bureau acquiesces.

Iowa. Sources are required to report excess emissions and if a trend of non-compliance is indicated penalties can be recovered. Excess emissions due to process/control equipment malfunctions are to be reported to DEQ within the next working day. There is apparently no penalty for failure to report.

Sources are required, with "all practical speed" to correct the problem, reduce the frequency of occurrence, and minimize the time and amount of excess emissions. Approximately 500 reports are submitted per year, 10% of which reportedly originate with DEQ visible emission observations. The study noted that in the period 1974-1977 two cement plants submitted 744 and 824 malfunction reports respectively.

Following the malfunction, the DEQ may conduct a very informal consultation and require a report of causes and actions and schedules to alleviate the problem.

New York. New York Regions VIII and IX have no formal reporting system as such but nevertheless receive approximately 700 reports of equipment malfunction per year. Sources with recurring equipment maintenance problems are requested to submit maintenance log sheets on a regular basis. This practice has reportedly been effective in several cases in reducing the frequency and duration of excess emissions.

Houston. Sources in Texas are required to notify the TACB as soon as possible after a "major upset" (defined as a period of excess emissions contravening TACB regulations). Sources must also report at least 10 days prior to planned maintenance. The TACB may inspect the source to verify that steps are taken to limit emissions during maintenance. Sources may apply for an exemption from violation if the cause was outside the source's control.

Chicago. Chicago's malfunction reporting requirement is contained in "Standard Operating Condition #12 for Operating Permits". If a source operates in excess of the standard during malfunction, it must immediately notify the agency by telegram and comply with instructions of the Field Operations Section office. A requirement to maintain records may also be imposed.

Regulations provide that sources experiencing malfunctions "not continue to operate beyond such time as is necessary to prevent injury to persons or severe damage to equipment or to provide essential service." The study did not address whether shutdowns have occured as a result of this requirement.

A single engineer in the field office reviews malfunction report submissions for a specific source; thus repeated malfunctions result in source-agency interaction regarding causes and remedial action.

4.2.3 Fuel Sample Analysis

The use of low-sulfur fuels is an accepted control strategy reducing SO_x emissions. In achieving these reductions, many agencies have found that fuel sampling for BTU content and percent sulfur can serve as an indicator of compliance status.

Most of the agencies studied have their own fuel sampling programs. Several, such as New York, depend on the source to conduct sampling and testing, and furnish reports of results to the agency. A requirement is generally imposed to keep records of BTU and percent sulfur content of fuel used throughout the year. An interesting reported result of the low sulfur fuel and sampling programs is source policing suppliers by sampling and suppliers policing themselves. Table 4.8 summarizes study data regarding agency fuel sampling.

In Connecticut some 2500 sources are covered by the fuel sampling program administered by the Field Operations Group. Approximately 100 samples, collected in areas of high SO_2 or suspected problems, are spot checked annually. The Connecticut standard is 0.5% sulfur content (dry weight). About 95% of the sources sampled are found to be in compliance. Violations result in NOV's in response to which sources/suppliers submit shipment and delivery records for 6 months to verify fuel delivery. Chronic violations result in referral for formal enforcement action. Connecticut's fuel sampling program is outlined in Figure C.

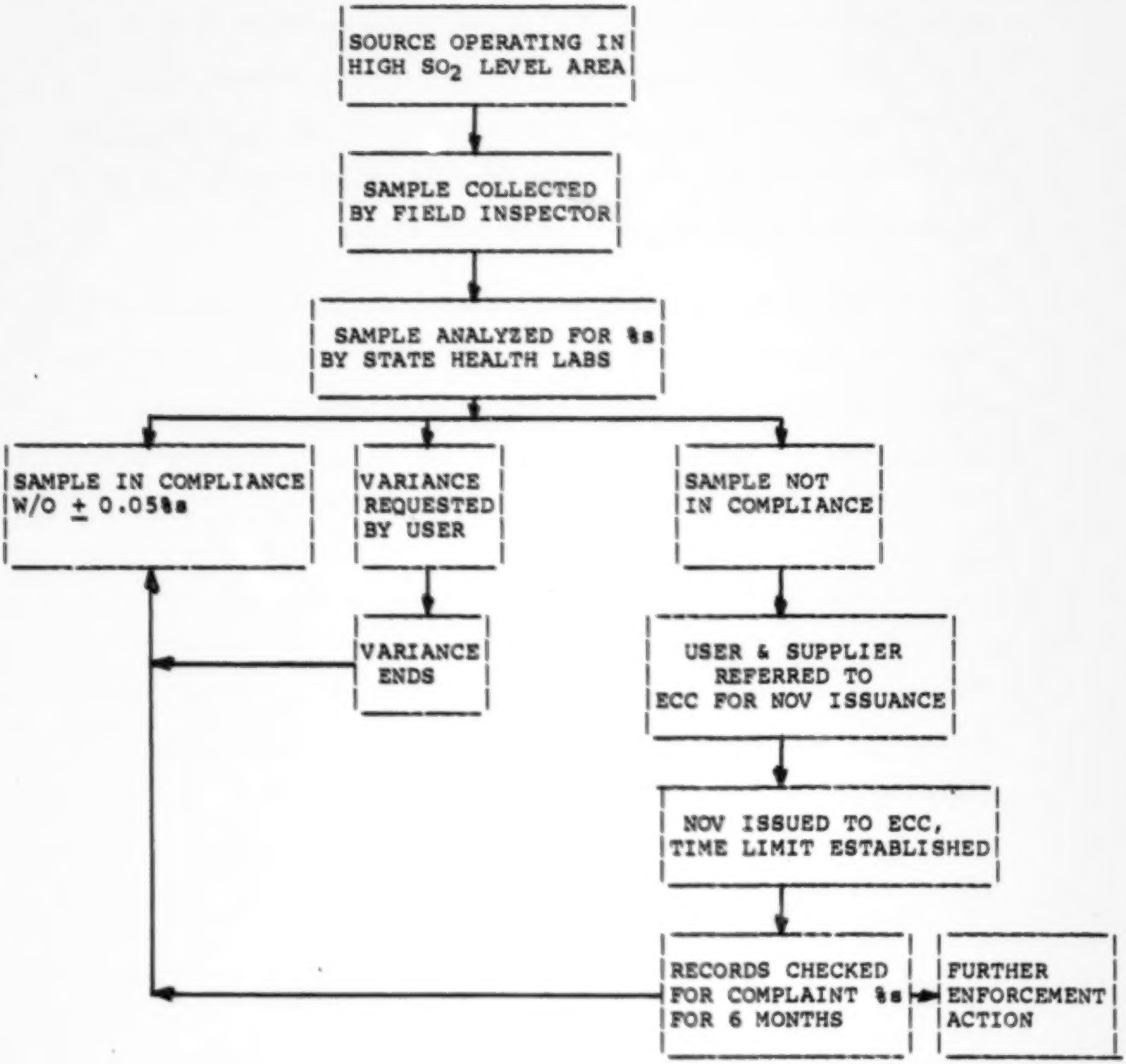
Table 4-8

FUEL SAMPLING

	CHICAGO ILL.	CONN.	HOUSTON TEXAS	IOWA	NEW JERSEY	N.Y. (REG.VIII) IX	N.C.	ORE.	SAN DIEGO CA.
Number of Sources Sampled Per Year		100			350	100	200		
By Whom Samples Taken		Agency			Agency	Sources and Suppliers			Agency
Results (Compliance Rate)		95%			90%				

Figure C

CONNECTICUT FUEL SAMPLING PROGRAM


SOURCE OPERATING IN HIGH SO2 LEVEL AREA
SAMPLE COLLECTED BY FIELD INSPECTOR
SAMPLE ANALYZED FOR %s BY STATE HEALTH LABS
SAMPLE IN COMPLIANCE W/O ± 0.05%s
VARIANCE REQUESTED BY USER
SAMPLE NOT IN COMPLIANCE
VARIANCE ENDS
USER & SUPPLIER REFERRED TO ECC FOR NOV ISSUANCE
NOV ISSUED TO ECC, TIME LIMIT ESTABLISHED
RECORDS CHECKED FOR COMPLAINT %s FOR 6 MONTHS
FURTHER ENFORCEMENT ACTION

Source: Excess Emissions Program Final Task C Report for Connecticut Department of Environmental Protection Compliance Analysis Study, The Research Corporation of New England (TRC), 1979.

The New Jersey internal labs tested about 350 oil samples in 1977. About 10 percent were found to be in violation. More sources are sampled in regions where RAPCA's conduct inspections. For violations, administrative orders are issued specifying compliance dates and sources are generally reinspected. There are also 4 sources using coal for which samples are tested at least once per year.

In New York most sampling is done by fuel vendors and users rather than by the Regional offices. Region IX with 8-10 sources receives reports on a monthly basis. Approximately 100 samples per year are analyzed. Regional officials feel that low sulfur fuel enforced by sampling is the most effective SO_x control.

San Diego samples and analyzes incoming oil shipments. Frequency of sampling is determined by sulfur content (0.5 percent -- all shipments tested; 0.2 or less -- randomly tested).

4.3 ENFORCEMENT

The following section contains a general discussion of enforcement mechanisms, based upon the positive, often common program elements discerned in the State and local agency reports, as well as an agency-specific description of enforcement procedures. Tables 4-9 (p. 101) and 4-10 (p. 102) summarize (p. 102) the Agency response to violations and the sanctions/penalties imposed by the agencies.

Enforcement action is triggered by detection of a violation of a legal requirement. Such violations may come to the attention of agency personnel in a number of ways, as discussed in the previous two sections and listed below:

1. Agency Activities
    - o Inspections
    - o Surveillance
    - o Stack Tests
2. Complaints

3. Source Self-Monitoring
    - o Continuous Monitoring
    - o Malfunction Reporting
    - o Fuel Sample Analysis

The Inspector is generally the vital initial link in agency-source interaction. Even with continuous monitoring and reporting, and malfunction reporting by sources, an inspector usually visits the site to confirm a violation before a citation is issued.

4.3.1 Notice of Violation

The agencies studied employ one of two approaches to issuing Notices of Violations (NOVs). The inspector may issue a NOV on the spot, or he may initiate the process by submitting paperwork to Headquarters where supervisory personnel will decide whether an NOV is warranted. In either event the inspector has considerable discretion, thus for 'minor' violations the inspector may issue an informal warning and make no record of the transaction -- this is common in most States. Therefore, inspectors need sufficient expertise to independently determine severity of violations, and to protect against being intimidated by claims made by source personnel.

In the interest of consistency and fair application of requirements it is important that inspector discretion be kept within reasonable bounds. Where Inspector discretion is a recognized practice agencies need criteria for determination of 'minor' violations and initiation of formal enforcement actions. None of the agencies studied have set such criteria; although New Jersey has established criteria to guide exercises of prosecutional discretion for handling cases after they are reported by inspectors.

Potentially important trend information is lost when inspectors are not requested to keep records of informal warnings. Furthermore, keeping of records facilitates the follow-up which should (but does not always) accompany all enforcement actions including informal warnings.

The NOV serves several functions beyond merely notifying the source of detection of a violation. Where appropriate, the NOV specifies a time frame for completion of corrective action and requires the source to report the cause of the violation and corrective action to be taken. Where a malfunction was involved, the NOV usually specifies measures taken to minimize excess emissions.

A penalty may accompany the NOV, but is usually reserved for the next step which results when sources fail to comply with the NOV (these NOV related penalties are generally small, similar in nature to tickets).

The 'Order' which follows the NOV is a formal, legally enforceable document which specifies requirements such as compliance schedules and progress reports. In the relatively small number of these more formal actions initiated, the NOV/Order sequence is reported to be generally sufficient to restore compliance.

Agencies vary in the use of NOV's. As would be expected, frequency of use determines the seriousness with which such mechanisms are viewed. Thus in Connecticut and New Jersey the NOV is a routine occurrence while Oregon and Iowa reserve the NOV for major, chronic, recalcitrant or unresponsive violators.

Treat of shutdown and permit non-renewal have been used infrequently as alternatives to NOVs, but are nevertheless reported as credible tools. Chicago reports effective use of 'sealing' powers (see p. 120 for discussion).

4.3.2 Sanctions

Agencies also have administrative and judicial mechanisms for imposition of sanctions if the need arises. These mechanisms are necessary even if the agency has an explicit policy of voluntary, cooperative compliance.

4.3.2.1 Administrative Remedies

Limited legal resources, crowded court dockets, and the potential for protracted and often inconclusive litigation, have induced most states to rely upon administrative or quasi-administrative enforcement mechanisms.

In most states the issuance of the NOV, and the first stages of interaction with the source in which corrective action plans and activities are elicited, are handled administratively. Due process protection for sources and traditional concepts of separation of powers are preserved through administrative procedures and through judicial appeal mechanisms after exhaustion of administrative remedies.

4.3.2.2 Judicial Remedies

Environmental litigation is often complex, depending upon accurate determination and validation of the nature and extent of violations. In the enforcement of air pollution control regulations, the use of judicial remedies follow traditional law enforcement pathways. In theory, the system works as follows. An inspector gathers evidence, the evidence is presented to the appropriate legal branch (city or county attorney, or state attorney general) which prepares a case and initiates litigation if negotiations are unsuccessful.

Enforcement supervisory personnel must insure that inspectors are familiar with the substantive and procedural elements of obtaining legally sufficient evidence. Legal personnnel can assist in this process initially by outlining required case preparation elements and activities; and subsequently, by providing timely, informative feedback regarding the adequacy of case preparation efforts. Case preparation manuals can serve as a permanent repository of information to assist both enforcement and legal personnel in performance of their respective functions.

Although certainly necessary, the mere existence of judicial mechanism is not sufficient to ensure effective law enforcement. Uncertainty surrounding the nature and extent of violations, and other factors require that environmental law enforcement efforts achieve substantial coordination and integration between legal and technical functions. A vital element of integration is timely availability of legal resources. This involves authority for the agency to contact the legal branch directly as well as sufficient interest, expertise, and allocation of resources. For a time San Diego was hampered in its effort to enforce air pollution laws by the necessity of obtaining a resolution from the County Board of Supervisors before initiating a civil action.

Periodic strategy sessions may be used to develop and revise enforcement policies and priorities. New Jersey's monthly meetings between legal staff and inspection personnel to discuss future referrals are a good example.

4.3.3 Description of Nine State Enforcement Systems

Virtually without exception the agencies studied have adopted a cooperative approach to bringing sources into compliance. In many agencies "voluntary compliance," or a "cooperative approach" is an explicit policy. The N.C. study states that every avenue of cooperation will be pursued before formal action will be taken or sanctions imposed. Even the N.J. agency, which purports to have a rigorous enforcement program, exercises discretion prior to taking action for minor violations.

One of the more troubling observations is the one made by several agencies--that detection of violations is a greater problem than returning a source to compliance once violation is detected. These Agencies have pointed out the need for improved detection technology and strategies.

Table 4.9 summarizes activities undertaken by Agencies to return violating sources to compliance. Table 4.10 summarizes the agency actions relating to sanctions. Following the tables is a brief description of recent actions undertaken by each State or local agency to enforce compliance.

Table 4-9

AGENCY REPONSE TO VIOLATIONS

	CHICAGO ILL.	CONN.	HOUSTON TEXAS	IOWA	NEW JERSEY	N.Y. (REG. VIII)	N.C.	ORE.	SAN DIEGO CALIFORNIA
INITIAL VIOLATIONS									
Informal or Formal Reponse	Informal	Formal	Formal	Informal	Formal	Formal	Informal	Informal	Formal
Type of Response*	Office Hearing	NOV (800/ 1978)	NOV (1824/yr)	Warning and Resolution	AO (800/yr)	NOV (65/yr)	Warning and Resolution	Verbal Warning and/or Letter	NOV
Exceptions to Policy	Occassional Ticketing	———	———	NOV for known recalcitrants only	Informal for Nuisance Cases (Conference)		NOV (65/yr)	NOV (204/ 1978)	
CONTINUED OR REPEATED VIOLATIONS									
Action*	Sealing Order	State Order	Order	Order	AO and/or CO	Order	SOC	NOI or Civil Penalties	Citation
Number of Actions	12 Since 1972	———	8 (1977)	28 (10/77 to 6/78)	AO-800/yr CO-50/yr	10% of Violators	5 (1978) 24 (1977)	19 NOI/yr 24 penalties/ yr.	Infrequently used

* NOV: Notice of Violation
AO : Abatement Order
CO : Consent Order
SOC: Special Order By Consent
NOI: Notice of Intent to Assess Civil Penalties

Table 4-10

SANCTIONS: ADMINISTRATIVE AND JUDICIAL

	CHICAGO ILLINOIS	CONNECTICUT	HOUSTON TEXAS	IOWA	NEW JERSEY	NEW YORK (REG.VIII)	NORTH CAROLINA	OREGON	SAN DIEGO CALIFORNIA
ADMINSTRA-TIVE SANCTIONS									
TYPE	Ticket	Non-Compliance Penalty	Civil Penalty		NOP/OPS[2]	Ticket	Civil Penalty	Civil Penalty	Citation
#IMPOSED		Few			250 NOPS/yr	Pilot Ticketing System	20 (1975-1978) 4 (1978)	95 (1977)[5] 24 (1978)	Rare
AMOUNT	1st 100-300 2nd 300-500 3rd - 500		Typically $250-$500		Escalation Scale [3]		Average $250-$500 [4]	Not to exceed $10,000/day	$500/Day
JUDICIAL SANCTIONS									
Referrals (#)		Infrequent	12 (1977)	Infrequent	33 (1978)	Infrequent	Infrequent		31[6]
Cases/Yr Filed			12 (1977)		4 (1977) 28 (1978)				17[6]
Convictions			5 Settled (1977)						16[6]
Amount of Fines					CJRAPCA 135 Court cases $15,000 in fines (1977)				$4165[6]

1. No Fines Over $500 Have Been Levied
2. Notice of Prosecution/Offer of Penalty Settlement (Quasi-Administrative)
3. Depending on Frequency and Type of Violation
4. Occassional penalty as high as $1500-$2000.
5. Nearly all penalties for open burning violations.
6. January - October 1978.

Connecticut. Violations are detected by inspectors of the Field Operation Group, by the Permits Group, the Enforcement Control Center (ECC) or by the Monitoring Group. A notice of violation is initiated with referral to the ECC for enforcement follow-up. ECC issued about 800 NOV's in 1978.

The NOV includes a short grace period for completion of remedial action. Failure to comply results in a State Order (S.O.) which includes a compliance schedule and a progress report requirement.

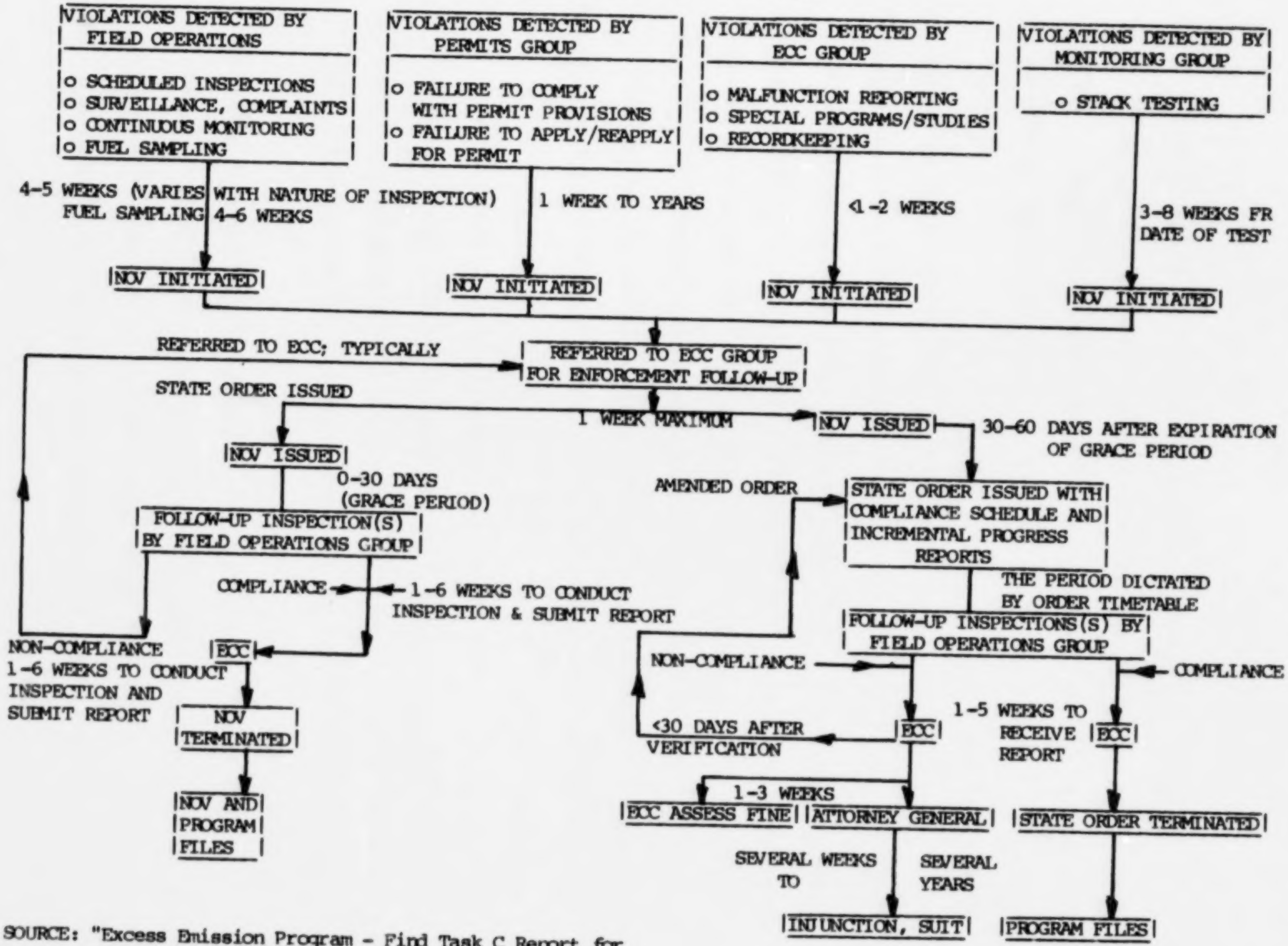
The NOV/S.O. approach is generally sufficient to restore compliance. (An estimated 5-10 S.O.'s per year are for O&M related activities.) In the small number of cases where a S.O. does not suffice, the agency takes one of three actions -- if the problem was beyond the control of the source (e.g., delayed delivery of equipment) an Amended Order is issued; the ECC can also impose a civil penalty or refer to the Attorney General's office.

Connecticut prefers not to refer cases to the Attorney General, citing as reasons the time and effort involved and the few injunctions which result from referrals. Development of the administratively imposed non-compliance penalty was a partial response to these problems.

An excellent summary of Connecticut's program is provided in Figure D, taken from the Connecticut study.

Figure D

CONNECTICUT ENFORCEMENT PROCEDURES


VIOLATIONS DETECTED BY FIELD OPERATIONS
o SCHEDULED INSPECTIONS
o SURVEILLANCE, COMPLAINTS
o CONTINUOUS MONITORING
o FUEL SAMPLING
VIOLATIONS DETECTED BY PERMITS GROUP
o FAILURE TO COMPLY WITH PERMIT PROVISIONS
o FAILURE TO APPLY/REAPPLY FOR PERMIT
VIOLATIONS DETECTED BY ECC GROUP
o MALFUNCTION REPORTING
o SPECIAL PROGRAMS/STUDIES
o RECORDKEEPING
VIOLATIONS DETECTED BY MONITORING GROUP
o STACK TESTING
4-5 WEEKS (VARIES WITH NATURE OF INSPECTION)
FUEL SAMPLING 4-6 WEEKS
1 WEEK TO YEARS
<1-2 WEEKS
3-8 WEEKS FR DATE OF TEST
NOV INITIATED
NOV INITIATED
NOV INITIATED
NOV INITIATED
REFERRED TO ECC; TYPICALLY
REFERRED TO ECC GROUP FOR ENFORCEMENT FOLLOW-UP
STATE ORDER ISSUED
1 WEEK MAXIMUM
NOV ISSUED
NOV ISSUED
30-60 DAYS AFTER EXPIRATION OF GRACE PERIOD
0-30 DAYS (GRACE PERIOD)
FOLLOW-UP INSPECTION(S) BY FIELD OPERATIONS GROUP
AMENDED ORDER
STATE ORDER ISSUED WITH COMPLIANCE SCHEDULE AND INCREMENTAL PROGRESS REPORTS
THE PERIOD DICTATED BY ORDER TIMETABLE
COMPLIANCE
1-6 WEEKS TO CONDUCT INSPECTION & SUBMIT REPORT
FOLLOW-UP INSPECTIONS(S) BY FIELD OPERATIONS GROUP
NON-COMPLIANCE
1-6 WEEKS TO CONDUCT INSPECTION AND SUBMIT REPORT
ECC
NOV TERMINATED
NOV AND PROGRAM FILES
NON-COMPLIANCE
COMPLIANCE
<30 DAYS AFTER VERIFICATION
ECC
1-5 WEEKS TO RECEIVE REPORT
ECC
1-3 WEEKS
ECC ASSESS FINE
ATTORNEY GENERAL
STATE ORDER TERMINATED
SEVERAL WEEKS TO SEVERAL YEARS
INJUNCTION, SUIT
PROGRAM FILES

SOURCE: "Excess Emission Program - Find Task C Report for Connecticut Department of Environmental Protection Compliance Analysis Study," TRC, 1979.

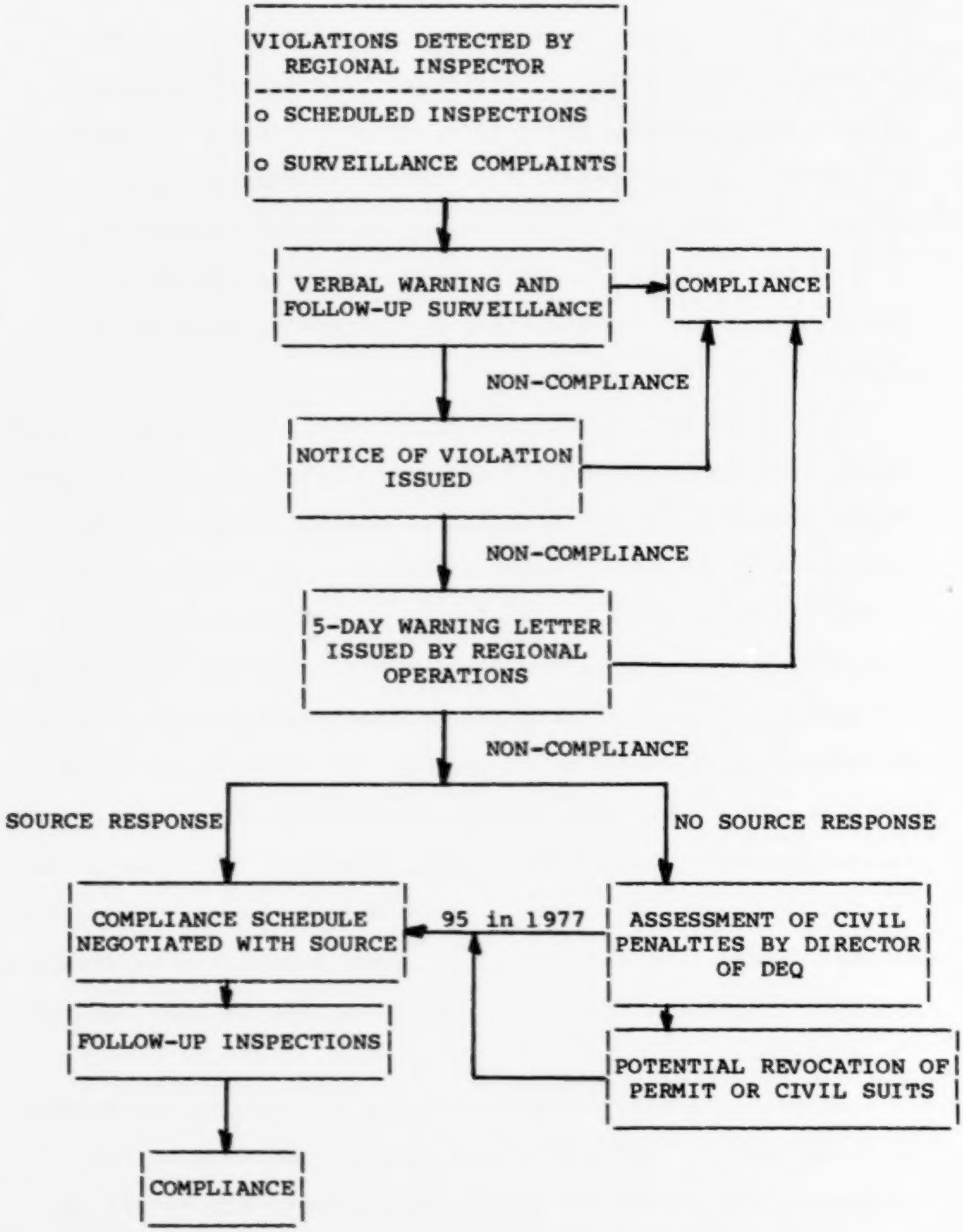
Oregon. Minor violations observed by field staff result in an informal verbal warning and/or letter with follow-up surveillance to ensure corrective action. Major, chronic, or O&M problems result in initiation of an NOV by the field office.

In 1978, 37 major sources and 167 minor sources received NOV's requiring them to contact the agency regarding intended corrective action and time frames. Failure to contact the agency within the time specified results in a 5-day Warning Letter or Notice of Intent to Assess Civil Penalties (NOI); this indicates DEQ intent to assess civil penalties (not to exceed $10,000 per day) if the source does not establish contact within 5 days. In 1978, 13 major and 6 minor sources received NOI's.

A special DEQ committee assesses civil penalties. In 1977, 95 penalties (75 for open burning) were assessed. In 1978, 10 major and 14 minor (all open burning) sources received penalties in amounts totaling $8,675 and $3,175 respectively.

Continued recalcitrance results in threats of permit revocation (no cases have gone beyond the threat stage) or bringing of a civil suit (none filed to date). A Summary of Oregon Enforcement activities is contained in Figure E.

Figure E. OREGON ENFORCEMENT PROCEDURES


VIOLATIONS DETECTED BY REGIONAL INSPECTOR
o SCHEDULED INSPECTIONS
o SURVEILLANCE COMPLAINTS
VERBAL WARNING AND FOLLOW-UP SURVEILLANCE
COMPLIANCE
NON-COMPLIANCE
NOTICE OF VIOLATION ISSUED
NON-COMPLIANCE
5-DAY WARNING LETTER ISSUED BY REGIONAL OPERATIONS
NON-COMPLIANCE
SOURCE RESPONSE
NO SOURCE RESPONSE
COMPLIANCE SCHEDULE NEGOTIATED WITH SOURCE
95 in 1977
ASSESSMENT OF CIVIL PENALTIES BY DIRECTOR OF DEQ
FOLLOW-UP INSPECTIONS
POTENTIAL REVOCATION OF PERMIT OR CIVIL SUITS
COMPLIANCE

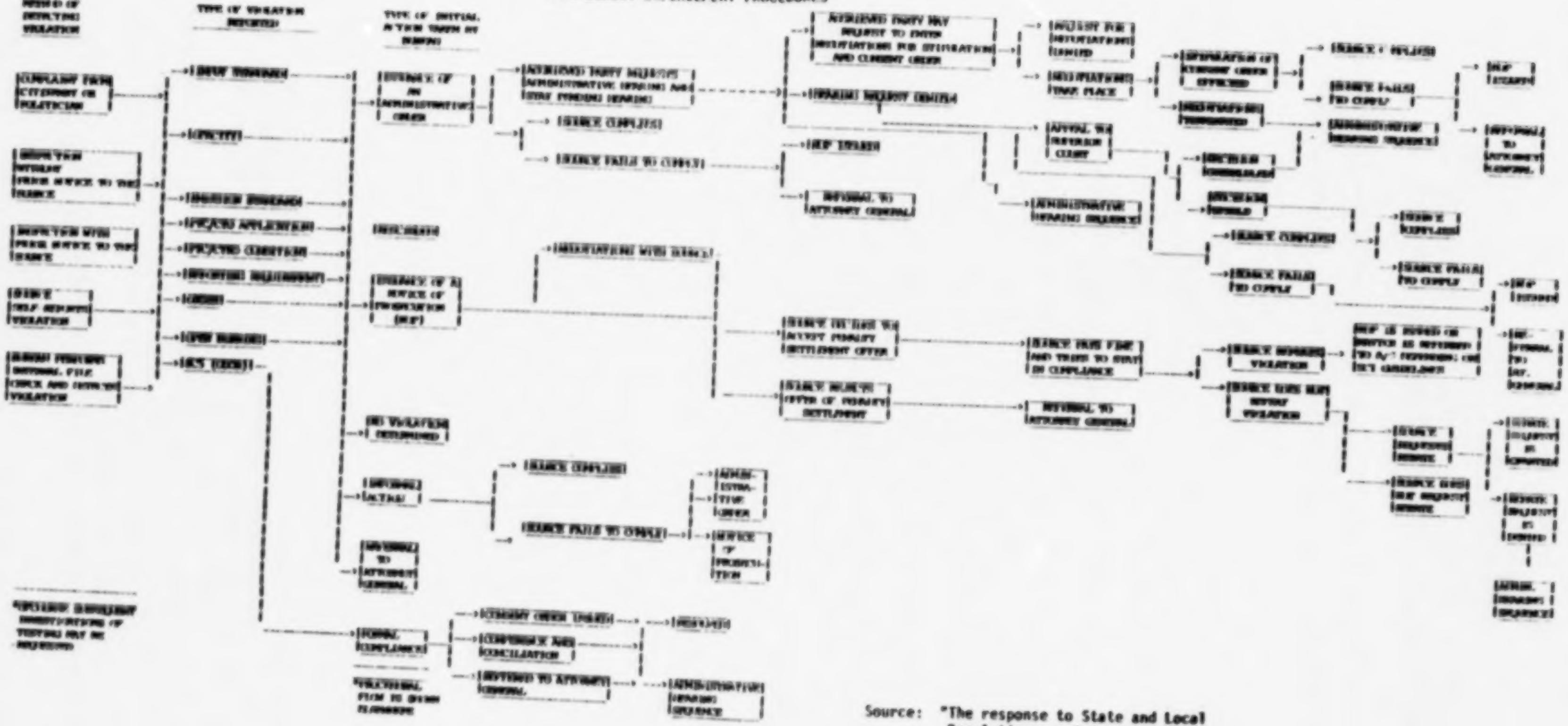
Source: "Excess Emission Program Final Task C Report for Oregon Department of Environmental Quality, TRC, 1979.

New Jersey. New Jersey's enforcement activities are described below and summarized in Figure F and Tables 4-11 through 4-13. Approximately 1600 violations per year are reported by inspectors to the Investigation and Inspection Section which reviews the documentation to determine whether a violation has occurred. As a result of this process, about 200 cases are discarded. Prosecutorial discretion in handling the remaining cases is reportedly limited by informal procedures restricting discretion to cases which meet established criteria.

About 250 Notices of Prosecution (NOP) are issued per year, accompanied by an Offer of Penalty Settlement (the Bureau has been authorized to settle claims). An escalating scale of relatively small penalties is followed, with eventual referral to the Attorney General. Negotiations are ocassionally conducted to set the amount of the penalty. Smaller penalties are for such violations as exceeding allowed sulfur contact of fuels or operating without a valid permit. The largest penalties are for violations of concentration or mass emission rates, and the Bureau has reportedly sought larger penalties for cases involving threats to health or other considerations. The penalty regulations contain rebate provisions for subsequent exemplarly performance; however, only about 15% of the penalized sources have applied for the rebate.

Regulations also contain criteria for determining whether to issue Administrative Orders or NOP's. About 4% of the administrative orders and penalty assessments are rescinded, usually for minor violations or presence of extenuating circumstances.

Figure F
NEW JERSEY ENFORCEMENT PROCEDURES



Source: "The response to State and Local Regulations on Emissions to the Atmosphere", Environmental Law Institute, Washington, D.C., 1978.

Reproduced from best available copy.

Table 4-11

NEW JERSEY SUMMARY OF WHICH VIOLATION DETECTION METHODS INITIATE WHICH TYPES OF VIOLATION DISCOVERIES

TYPE OF VIOLATION DISCOVERED	METHOD WHICH INTIATED VIOLATION DETECTION				
	COMPLAINT	INSPECTION		SELF REPORT	FILE CHECK
		WITH NOTICE	WITHOUT NOTICE		
Input Standard	——	10%	90%	——	——
Opacity	15%	——	80	5%	——
Emissions Standard	5	20	70	5	——
SC5 (Odor)	80	——	20	——	——
Open Burning	20	——	80	——	——
PTC/CTO Application[1]	——	20	65	5	10%
PTC/CTO Condition[2]	5	20	70	5	——
Reporting Requirement[3]	——	15	15	——	70%
"Pre-Printed" Admin. Orders [4]	5	——	95	——	——
Administrative or Court Orders[5]	30%	10%	50%	10%	——

SOURCE: "The Response to State and Local Regulations on Emissions to the Atmosphere," ELI, 1979.

NOTES:

1. A violation of the requirement to obtain a PTC or CTO when constructing or operating a new or altered source, pursant to Subchapter 8.
2. A violation of a condition embodied in the PTC and CTO; e.g., operating the process with the control equipment turned off.
3. A violation of a requirement imposed on a source by the Bureau to submit a report of its progress in construction, emissions or other such items.
4. A violation of an administrative order issued on a pre-printed form after an initial violation is detected
5. A violation of a consent court or departmental order.

Table 4-12

NEW JERSEY SUMMARY OF INITIAL ACTIONS TAKEN AND FINAL ACTIONS NECESSARY TO CORRECT TYPES OF VIOLATIONS

TYPE OF VIOLATION DETERMINED	TYPE OF INITIAL AND FINAL ENFORCEMENT ACTION TAKEN							
	INFORMAL ACTION		ISSUANCE OF NOTICE OF PROSECUTION		ISSUANCE OF ADMINISTRATIVE ORDER		REFERRAL TO A/G	
	Initial[1]	Final[2]	Initial	Final	Initial	Final	Initial	Final
Input Standard				5%	100%	95%		Rare
Opacity	10%	10%		14%	90%	75%		Rare
Emissions Standard					100%	90%		10%
PTC/CTO APPLICATION[3]				19%	100%	80%		1%
PTC/CTO Condition[4]				19%	100%	80%		1%
Reporting Requirement[5]	80%	80%			20%	18%		2%
"Pre-Printed" Admin. Orders [6]				90%				10%
Administrative of Court Orders[7]							100%	100%
SC5 (Odor)	100%[8]	90%[8]				8%		2%
Open Burning				10%	100%	90%		Rare

SOURCE: "The Response to State and Local Regulations on Emissions to the Atmosphere," ELI, 1979.

NOTES:

1. An "initial enforcement action" is what action the Bureau takes first after detecting a violation; however, such an action is not always sufficient to compel compliance.
2. A "final enforcement action" is what action the Bureau usually has to take to actually compel compliance. Note that in may cases the "intial action" is also the "final action," since it compels compliance with no further action being necessary.
3. A violation of the requirement to obtain a PTC or CTO when constructing or operating a new or altered source, pusuanct to Subchapter 8.
4. A violation of a condition embodied in the PTC and CTO; e.g., operating the process with the control equipment turned off.
5. A violation of a requirement imposed on a source by the Bureau to submit a report of its progress in construction, emissions or other such items.
6. A violation of an order issued on a pre-printed form after an initial violation is detected.
7. A violation of a consent court or departmental order.
8. Really a formal conference - unique to SCS violation processing.

Table 4-13

NEW JERSEY ENFORCEMENT ACTIONS (1976-1978)

	Calendar Year		
Enforcement Action By the DEP*	1976	1977	1978
Administrative Order	679	791	901
Court Order	31	15	26
Notice of Prosecution	258	271	258
Administrative Hearing	2	3	2
Referral to Attorney General	5	39	33
Court Action	5	4	28

SOURCE: "The Response to State and Local Regulations on Emissions to the Atmosphere," ELI, 1979.

* The Regional Air Pollution Control Agencies also take enforcement actions. In 1977 the Central Jersey RAPCA issued 385 notices of violation, held 46 conferences, and took 135 cases to court, which resulted in $15,500 in fines. The RAPCAs also refer certain types of cases to the Bureau for prosecution.

Table 4.14

NEW JERSEY SUMMARY OF ACTIONS TAKEN BY THE ATTORNEY GENERAL AND THE PERCENT OF CASES RESOLVED BY THOSE ACTIONS

ACTION TAKEN BY ATTORNEY GENERAL	PERCENT OF TOTAL CASES RESOLVED	
	Penalty Cases	Order Cases
Warning Letter	90%	20%
Conference/ Administrative Hearing	Rare	60
Complaint Issued; Discovery Proceedings	5%	15%
Trial Conducted	5%	5%

SOURCE: "The Response to State and Local Regulations on Emissions to the Atmosphere," ELI, 1979.

About 50 times per year informal conferences are held. These are cooperative undertakings to improve performance of sources not in violation but which are not operating optimally.

For harder to prove nuisance type violations approximately 300 "Conference and Conciliation" actions take place, and result in compliance schedules and enforceable orders. About 50 consent orders for such violations are issued per year. Early diligence in verifying and prosecuting such violation's strengthened the Bureau's credibility.

Direct referral to the Attorney General occurs fewer than 5 times per year. These are cases involving threats to public health or frequent, flagrant violations.

New Jersey's Regional Air Pollution Control Associations also have a fairly active enforcement program with primary focus on the nuisance type violations. The CJRAPCA issued 385 NOV's, held 46 conferences, took 135 cases to court and imposed $15,000 in fines. Process violations are generally referred to the Bureau for state action.

New Jersey conducts monthly meetings between attorneys for the AG's office and personnel from the inspection/investigation section to discuss possible future referrals. This activity has reportedly reduced case rejections and file returns.

Prior to filing suit, the Attorney Generals's office sends a warning letter notifying the source of impending litigation unless the matter is settled. Where only a penalty is involved, 90% of the cases are settled. In case of injunction or compliance order, only 20% are settled; however, subsequent conferences and administrative hearings resolve about 60% of these cases. Approximately 5% of cases brought eventually go to trial. See Table 4-14 for a summary of actions taken by the Attorney General and the percent of cases resolved by those actins.

N. J.'s RAPCA reported that courts were reluctant to impose fines for minor violations. As a result the RAPCA does not got to court until 10-15 summons have been issued.

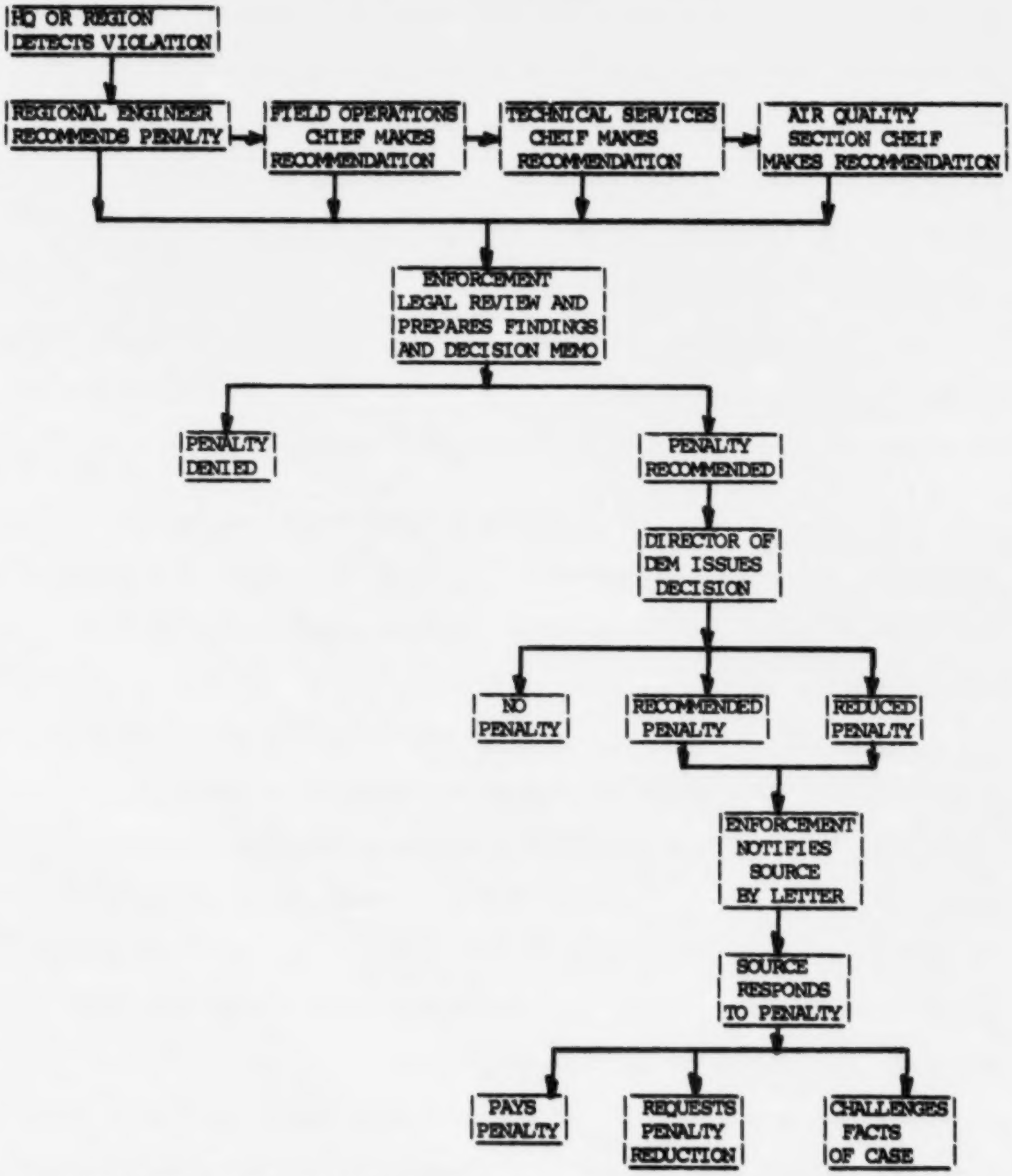
North Carolina. As previously discussed, North Carolina favors a cooperative approach. For this reason, inspectors and source operators frequently resolve violations without maintaining a record of the incident.

On occasions when the agency initiates "formal" agency action, a NOV is issued in which the source is generally requested to submit a proposed control plan within 60-90 days. A more serious action, but one infrequently used, is issuance of an Abatement Order (A.O.). The A.O. requires the source to cease emissions by installing equipment, improving operations or by shutting down.

The NOV and request for control plan sometimes initiate a process which culminates in a Special Order by Consent (SOC). The SOC embodies, in legally enforceable order form, the compliance schedule agreed upon by the source and the state. Schedules for sulfur oxide and particulate must be submitted to EPA Region IV for approval. Refusal of the source to enter into a SOC results in unilateral State imposition of a

Figure G

NORTH CAROLINA CIVIL PENALTY PROCESS


HQ OR REGION DETECTS VIOLATION
REGIONAL ENGINEER RECOMMENDS PENALTY
FIELD OPERATIONS CHIEF MAKES RECOMMENDATION
TECHNICAL SERVICES CHEIF MAKES RECOMMENDATION
AIR QUALITY SECTION CHEIF MAKES RECOMMENDATION
ENFORCEMENT LEGAL REVIEW AND PREPARES FINDINGS AND DECISION MEMO
PENALTY DENIED
PENALTY RECOMMENDED
DIRECTOR OF DEM ISSUES DECISION
NO PENALTY
RECOMMENDED PENALTY
REDUCED PENALTY
ENFORCEMENT NOTIFIES SOURCE BY LETTER
SOURCE RESPONDS TO PENALTY
PAYS PENALTY
REQUESTS PENALTY REDUCTION
CHALLENGES FACTS OF CASE

SOURCE: "Preliminary Evaluation of North Carolina's Program to Regulate Air Pollution From Stationary Sources, "Booz-Allen and PEDCO, 1979.

Table 4-15

NORTH CAROLINA ENFORCEMENT MECHANISMS: Frequency of Use FY 1975-1978

MECHANISM	1975	1976	1977	1978
NOVs	243	135	N/A	65
ABATEMENT ORDERS	N/A	N/A	N/A	5
SOCs	0	150	24	7
SPECIAL ORDERS WITHOUT CONSENT	0	0	0	0
CIVIL PENALTY[1]	4	10	2	4
CRIMINAL PROCEEDING	0	0	0	0

SOURCE: "Preliminary Evaluation of North Carolina's Program to Regulate Air Pollution From Stationary Sources," Booz-Allen and PEDCO, 1979.

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[1] Civil penalty data is by calendar year; other data is by fiscal year.

Table 4-16

NORTH CAROLINA: FINAL ACTION ON CASES REFERRED TO ENFORCEMENT

FINAL ACTION	1975	1976	1977	1978	TOTAL
Civil penalty issued	4	10	2	4	20
Warning letter sent	0	1	1	1	3
SOC signed	3	0	0	0	3
Action deferred	0	0	3		3
No action taken	4	4	4	1	13
Source out of business	2	0	0	0	2
Case open	0	1	1	3	5
TOTAL	13	16	11	9	49

SOURCE: "Preliminary Evaluation of North Carolina's Program to Regulate Air Pollution From Stationary," Booz-Allen and PEDCO, 1979.

compliance schedule in a Special Order Without Consent. No such Orders Without Consent were issued in the years 1975-1978.

Approximately 20% of cases referred to enforcement have resulted in civil penalties. Penalties average $250-$500.

Figure G describes North Carolina's civil penalty process.

Tables 4.15 and 4.16 provide data regarding frequency of enforcement activity for the years 1975-1978.

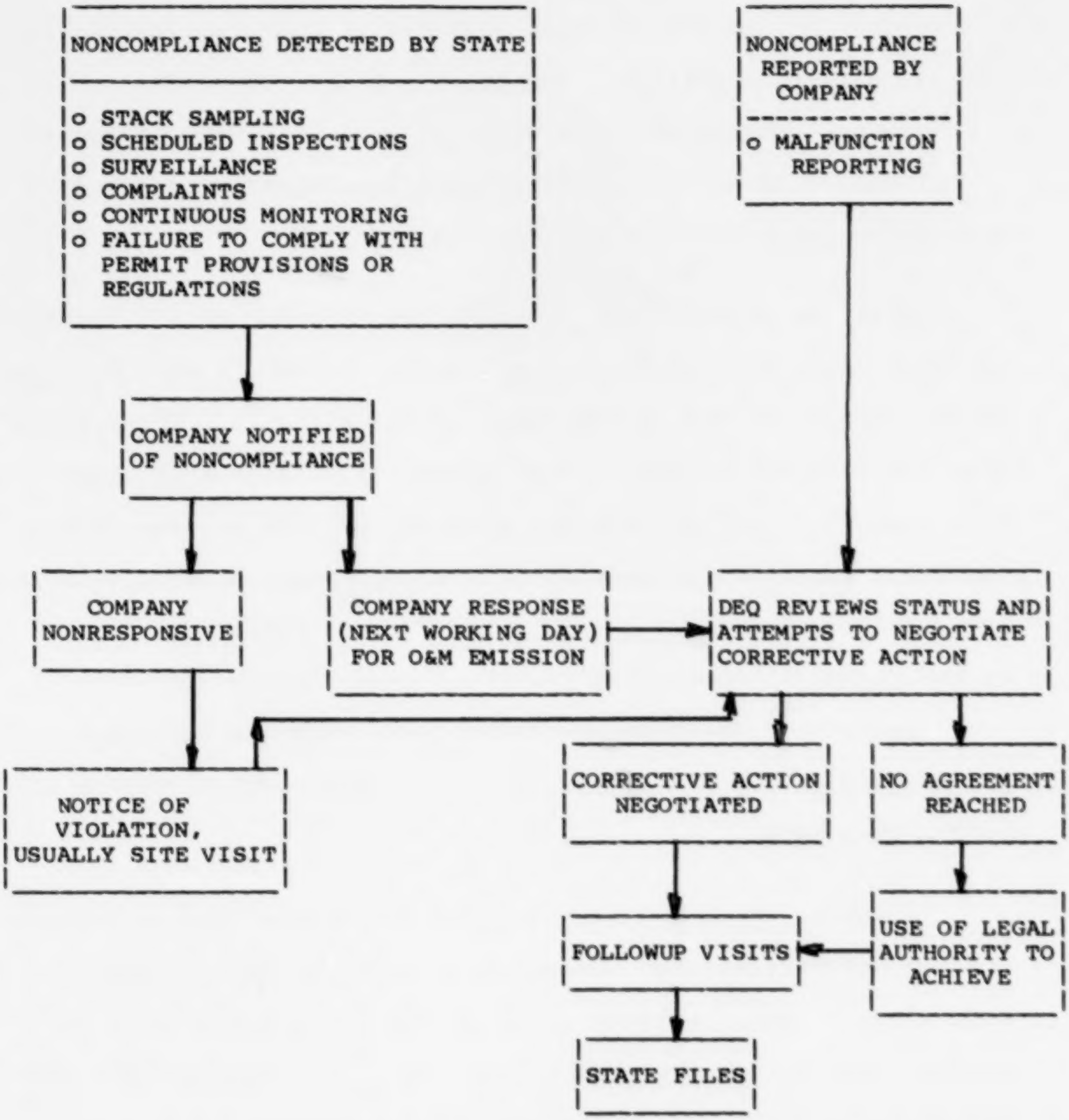
Iowa. As previously discussed, the Iowa DEQ relies heavily on negotiation and voluntary compliance. An NOV is sent only to those sources who are recalcitrant or unresponsive. Three NOV's have been issued for O&M related emissions. Since 1975 there have been 23 formal enforcement actions, and 136 consent orders. The state approach is reported by the contractor to work well in achieving and maintaining compliance, due in substantial part to the technical quality of the state personnel.

Figure H illustrates the operation of DEQ's enforcement program and Table 4-17 summarizes enforcement actions for Oct. 1977 - June 1979.

Illinois. At one time the Illinois EPA attitude in Chicago and throughout the State was apparently one of "sue first, talk later." This approach often proved counterproductive as sources, faced with the prospect of litigation, applied for and and received variances from the Pollution Control Board, thus negating most of the case preparation effort. Another

Figure H

IOWA ENFORCEMENT PROCEDURES


NONCOMPLIANCE DETECTED BY STATE
o STACK SAMPLING
o SCHEDULED INSPECTIONS
o SURVEILLANCE
o COMPLAINTS
o CONTINUOUS MONITORING
o FAILURE TO COMPLY WITH PERMIT PROVISIONS OR REGULATIONS
NONCOMPLIANCE REPORTED BY COMPANY
o MALFUNCTION REPORTING
COMPANY NOTIFIED OF NONCOMPLIANCE
COMPANY NONRESPONSIVE
COMPANY RESPONSE (NEXT WORKING DAY) FOR O&M EMISSION
DEQ REVIEWS STATUS AND ATTEMPTS TO NEGOTIATE CORRECTIVE ACTION
NOTICE OF VIOLATION, USUALLY SITE VISIT
CORRECTIVE ACTION NEGOTIATED
NO AGREEMENT REACHED
FOLLOWUP VISITS
USE OF LEGAL AUTHORITY TO ACHIEVE
STATE FILES

SOURCES: "Excess Emissions Program Task C Report on the Iowa State Department of Environmental Quality - Compliance Analysis Study," GCA, 1979.

Table 4.17

SUMMARY OF ENFORCEMENT ACTIONS IN IOWA

FACILITY TYPE	NUMBER OF ORDERS ISSUED OCTOBER 1977 to June 1979*
Steam Generators	5
Grain Handling	5
Ready Mix Concrete	5
Asphalt Plants	4
Cement Plants	2
Chemical Plants	2
Foundries	2
Carbide Plant	2
Alfalfa Dehydrating	1

*All of these orders have resulted in a demonstration of compliance or have been continued. There have been no court suits filed as a result of a failure of the above source categories to demonstrate compliance.

SOURCE: "Excess Emission Program Task C Report on the Iowa State Department of Environmental Quality - Compliance Analysis Study," GCA, 1979.

reported problem with this approach was the fact that sources won more than 90% of suits commenced. IEPA's Enforcement Division has modified its approach, employing enforcement conferences before resorting to other mechanisms.

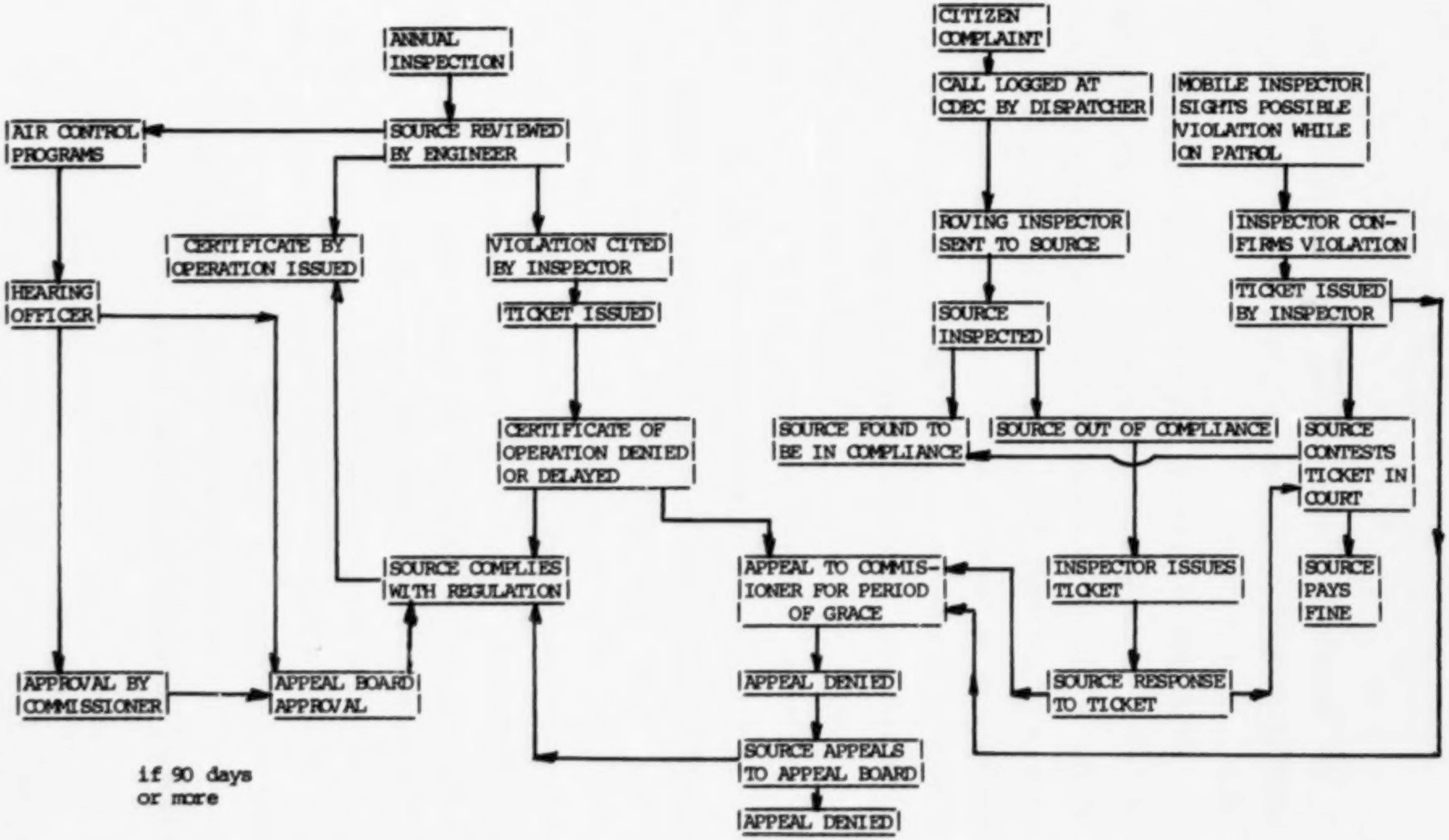
A single field engineer is responsible for a given source. Actions to be taken as a result of frequent malfunction reports, etc., are handled on a case-by-case basis. The engineer contacts the source to discuss the problem, and if necessary, recommends further action to the Pollution Control Board. A simultaneous enforcement action may be commenced.

Chicago, Illinois. CDEC performs enforcement function essentially independent of the IEPA. The IEPA - CDEC interagency agreement technically limits the CDEC to facilities less than 100 tons per year; however, complaints and mobile inspector reports do trigger CDEC enforcement actions against larger sources. The CDEC enforcement process is summarized in Figure I.

CDEC activities include assignment of field inspection teams to construction sites and transmission of information to the Engineering Service Department for review. The city has a co-ordinated program whereby an applicant receives all required permits in one trip. A side benefit is that all other city inspectors (electrical, plumbing etc.,) help to

Figure I

CHICAGO ENFORCEMENT PROCEDURES


ANNUAL INSPECTION
SOURCE REVIEWED BY ENGINEER
AIR CONTROL PROGRAMS
CERTIFICATE BY OPERATION ISSUED
VIOLATION CITED BY INSPECTOR
TICKET ISSUED
HEARING OFFICER
CERTIFICATE OF OPERATION DENIED OR DELAYED
SOURCE COMPLIES WITH REGULATION
APPROVAL BY COMMISSIONER
APPEAL BOARD APPROVAL
if 90 days or more
CITIZEN COMPLAINT
CALL LOGGED AT CDEC BY DISPATCHER
ROVING INSPECTOR SENT TO SOURCE
SOURCE INSPECTED
SOURCE FOUND TO BE IN COMPLIANCE
SOURCE OUT OF COMPLIANCE
MOBILE INSPECTOR SIGHTS POSSIBLE VIOLATION WHILE ON PATROL
INSPECTOR CON-FIRMS VIOLATION
TICKET ISSUED BY INSPECTOR
SOURCE CONTESTS TICKET IN COURT
SOURCE PAYS FINE
APPEAL TO COMMIS-IONER FOR PERIOD OF GRACE
INSPECTOR ISSUES TICKET
SOURCE RESPONSE TO TICKET
APPEAL DENIED
SOURCE APPEALS TO APPEAL BOARD
APPEAL DENIED

SOURCE: "Description of the Regulatory Process for the Chicago, Illinois Case Study," PES, 1979.

locate unauthorized construction. The end result of the permitting process for an air pollution source is a Certificate of Operation.

Violation of visible emission or process weight emission standards sometimes results in issuance of a ticket by the inspector. As part of the annual inspection a review is made of malfunction reports. If excessive frequency of malfunction is noted, the Engineering Service Department can disapprove the Certificate of Operation or request a "proof of maintenance" (reportedly used infrequently).

Sources whose requests for initial or renewal certificates are denied are afforded a variety of administrative avenues and time extensions in which to achieve compliance. Permit revocation cases result in hearings before the Appeals Board and the issuance of an order embodying negotiated solutions. Cases in which sources cannot initially comply begin with source submission of compliance plans after an office hearing. If a period greater than 90 days is involved a variance may be issued by the Appeal Board. Lack of equipment cases result in "grace periods" approved by Commissioner or Board. Fines and penalties are waived during this period, but willful failure to comply results in retroactive imposition, thus discouraging frivolous applications. In summary, negotiation of solutions is the primary mechanism, with agreed upon remedies incorporated in Board orders.

An installation permit inspection confirms installation of required equipment, discrepancies can result in permit revocation. An administrative hearing is held for 'failure to produce the permit' or 'failure to conform to specifications', to determine the basis for non-compliance. After the hearing the Commissioner may order cessation of work and "seal" the facility. In such cases an inspector visits the source daily until the order is lifted. The CDEC used its sealing powers 12 times since 1971.

Inspectors may issue tickets for violations according to the following schedule:

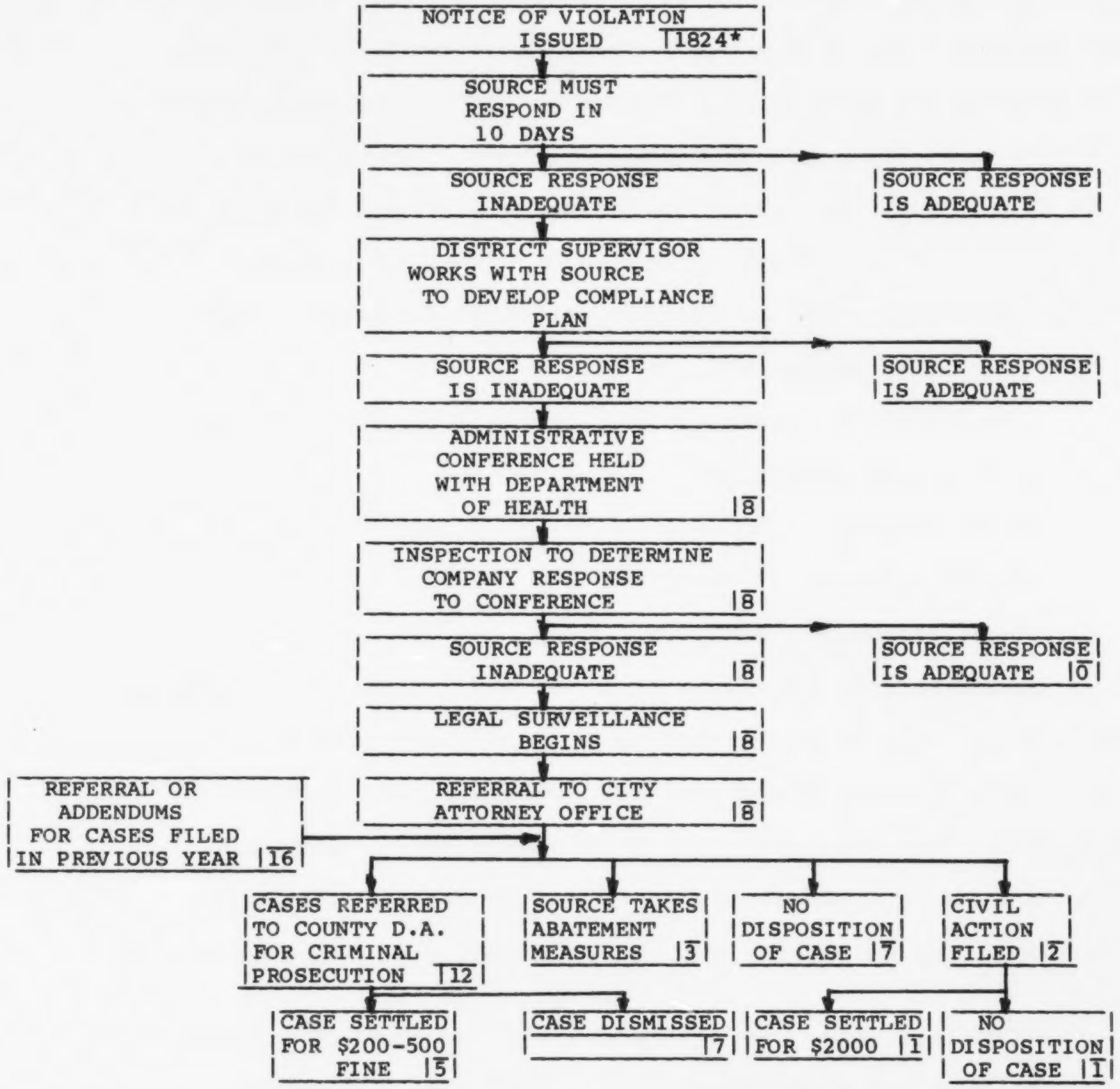
First offense	$100-300
Second offense	$300-500
Third offense	$500

No fines over $500 have been imposed. More than 3 offenses within 180 days is punishable as a misdemeanor with a 6 month jail term; however preference for negotiation to achieve compliance has precluded use of such sanctions. Sources with 3 or more offenses within 12 months can be called upon to appear and show cause why the equipment should not be sealed.

Houston, Texas. The Texas Air Control Board has delegated surveillance and enforcement responsibilities to the DOH. This delegation reduces but does not eliminate duplication of effort and sources' confusion. DOH also enforces a municipal incinerator ordinance. Figure J and Table 4.18 summarize Houston's Enforcement activities.

Figure J

HOUSTON ENFORCEMENT PROCEDURES
(INCLUDES NUMBER OF ENFORCEMENT CASES PROCESSED IN 1977)


NOTICE OF VIOLATION ISSUED 1824*
SOURCE MUST RESPOND IN 10 DAYS
SOURCE RESPONSE INADEQUATE
SOURCE RESPONSE IS ADEQUATE
DISTRICT SUPERVISOR WORKS WITH SOURCE TO DEVELOP COMPLIANCE PLAN
SOURCE RESPONSE IS INADEQUATE
SOURCE RESPONSE IS ADEQUATE
ADMINISTRATIVE CONFERENCE HELD WITH DEPARTMENT OF HEALTH 8
INSPECTION TO DETERMINE COMPANY RESPONSE TO CONFERENCE 8
SOURCE RESPONSE INADEQUATE 8
SOURCE RESPONSE IS ADEQUATE 0
LEGAL SURVEILLANCE BEGINS 8
REFERRAL OR ADDENDUMS FOR CASES FILED IN PREVIOUS YEAR 16
REFERRAL TO CITY ATTORNEY OFFICE 8
CASES REFERRED TO COUNTY D.A. FOR CRIMINAL PROSECUTION 12
SOURCE TAKES ABATEMENT MEASURES 3
NO DISPOSITION OF CASE 7
CIVIL ACTION FILED 2
CASE SETTLED FOR $200-500 FINE 5
CASE DISMISSED 7
CASE SETTLED FOR $2000 1
NO DISPOSITION OF CASE 1

SOURCE: "Preliminary Evaluation of City of Houston (Texas) Department of Health's Programs to Regulate Air Pollution from Stationary Sources, Booz-Allen and PEDCO 1979.

* Of 1824 NOVs issued in 1977, 87 NOVs were for particulate or sulfur oxide violations with measureable evidence.

Table 4-18

HOUSTON ENFORCEMENT ACTIONS (1975 - 1977)

	NOTICES OF VIOLATIONS ISSUED 1975	1976	1977
GENERAL RULES			
NUISANCES (RULES)	160	143	222
TRAFFIC HAZARD (RULE 6)	1	3	7
UPSET NOTIFICATION (RULE 7)	13	25	51
MAINTENANCE NOTIFICATION (RULE 8)			7
OUTDOOR BURNING (RULE 101.1)	351	206	
VISIBLE EMISSION			
OPACITY (RULE 103.1)	23	3	43
FLARE (RULE 103.2)	12	3	48
FUGITIVE (RULE 103.3)	127	108	163
TRUCKS, CARS, TRAINS, SHIPS (RULE 103.4 & 103.5)	314	223	381
PARTICULATE MATTER (MATERIALS HANDLING, CONSTRUCTION, ROADS) (RULE 104)	124	101	213
PARTICULATES (PROPERTY SAMPLES) (RULE 105)	38	33	39
GASES (SO_2) (PROPERTY SAMPLES) (RULE 201.07)		3	5
VOLATILE CARBON COMPOUNDS (REG.V)			1
FAILURE TO OBTAIN CONSTRUCTION OR OPERATING PERMIT (RULE 601)	6		23
LOCAL ORDINANCES (72-1915)	224	159	144
OTHER VIOLATIONS (4477-58-4.01)	16	119	232
TOTAL NUMBER OF NOTICES	1,429	1,129	1,824
CITATIONS ISSUED	9	2	1

SOURCES: "Preliminary Evaluation of the City of Houston, (Texas) Department of Health's Programs to Regulate Air Pollution from Stationary Sources, Booz-Allen and PEDCO, 1979.

Houston's enforcement program is heavily oriented toward administrative processing of local complaints. Most NOV's are issued for nuisance, outdoor burning and fugitive emissions. NOV's for opacity, stack tests and property line samples which can be documented account for about 2.5% of the total. Most problems are corrected after initial contact and NOV issuance, with no further administrative action by DOH after the source submits a control plan. In some instances the district supervisor works with the source to develop an acceptable plan. Increased surveillance may occur for several weeks after corrective action is completed.

More severe problems result in administrative conferences. Eight such conferences were held in 1977 involving management and higher level DOH officials. Source activities receive greater scrutiny and a written summary of source abatement commitments is prepared. 'Legal Surveillance' results when deemed appropriate (see Surveillance discussion).

The City Legal Department represent DOH in civil cases filed pursuant to the Texas Clean Air Act. Where necessary, the legal department refers cases to the County DA for criminal prosecution pursuant to the Texas criminal misdemeanor statute.

New York (Region IX). New York's regional offices become aware of violations by the normal mechanisms: complaints, surveillance, and inspections. Region IX also receives about 400 source self-reports per year.

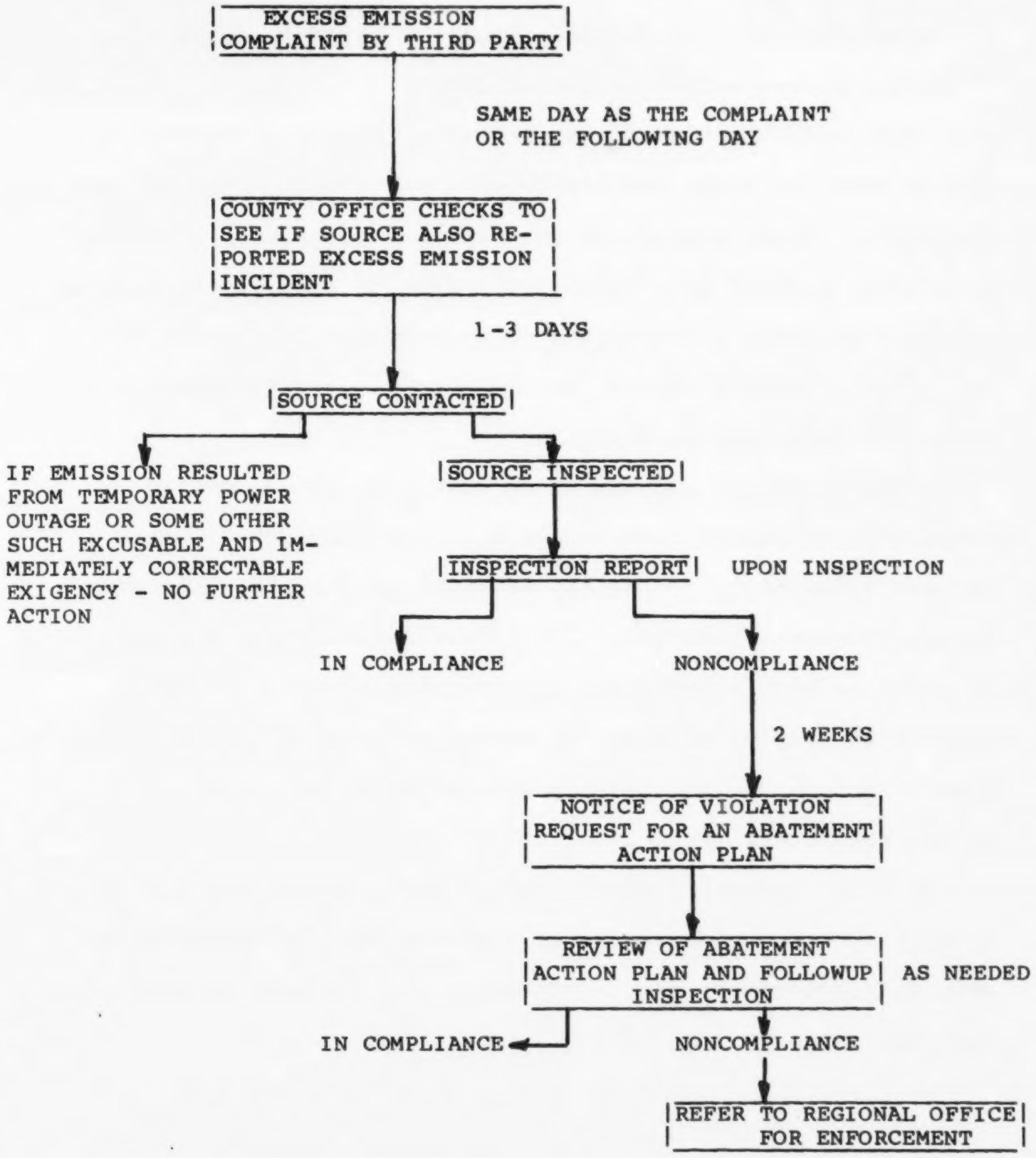
Upon verification of the violation, Region IX places the source under an order and may require the signing of a consent agreement. These activities are reported as generally informal in nature, a phone call being sufficient to resolve the problem. Figure K provides a flow chart of enforcement procedures for Region IX. Roughly 10% of the non-compliance situations in Region IX result in an order.

Theoretically, sources which have been cited undergo inspection to ensure continual compliance; however, a case-by-case judgment is frequently made due to the time-consuming nature of such activities. The threat not to renew permits is cited as highly effective and frequently used - to the point that hearing officer orders and court actions are rarely necessary. No case has even gone to jury trial in either region VIII or IX.

A pilot ticketing system is currently undergoing evaluation in Region VIII. An element of the program is matching fines with the seriousness of the violation and the cost savings of non-compliance.

Figure K

NEW YORK - REGION VIII - ENFORCEMENT PROCEDURES


EXCESS EMISSION COMPLAINT BY THIRD PARTY
SAME DAY AS THE COMPLAINT OR THE FOLLOWING DAY
COUNTY OFFICE CHECKS TO SEE IF SOURCE ALSO REPORTED EXCESS EMISSION INCIDENT
1-3 DAYS
SOURCE CONTACTED
IF EMISSION RESULTED FROM TEMPORARY POWER OUTAGE OR SOME OTHER SUCH EXCUSABLE AND IMMEDIATELY CORRECTABLE EXIGENCY - NO FURTHER ACTION
SOURCE INSPECTED
INSPECTION REPORT
UPON INSPECTION
IN COMPLIANCE
NONCOMPLIANCE
2 WEEKS
NOTICE OF VIOLATION REQUEST FOR AN ABATEMENT ACTION PLAN
REVIEW OF ABATEMENT ACTION PLAN AND FOLLOWUP INSPECTION
AS NEEDED
IN COMPLIANCE
NONCOMPLIANCE
REFER TO REGIONAL OFFICE FOR ENFORCEMENT

Source: "Excess Emission Program, Task C Report on the New York State Department of Environmental Conservation", GCA/Technology Division, July 1977.

San Diego, California. The San Diego Air Pollution Control District uses a multiple NOV system with an infrequently used citation authority, as shown in Figure L. The field activities, enforcement actions, and legal activities of the San Diego APCD are summarized in Table 4-19 (p. 133).

Originally the APCD used a warning letter/consultation/ conference/referral approach. The warning letter specified details of the offense(s) and recommended remedies. Referral for judicial action was a last resort.

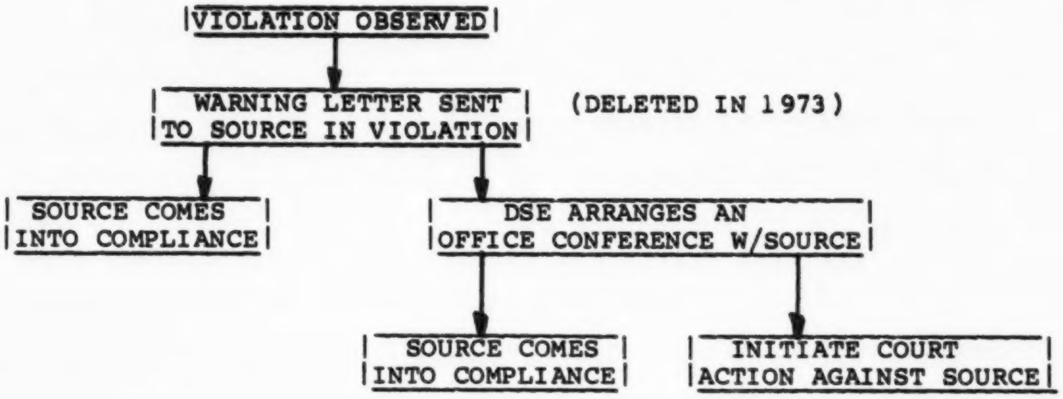
Now, after a violation is detected, an NOV is immediately issued notifying the source that a misdemeanor has occurred and that potential legal liability exists. Results are forwarded to the Chief of the Source Enforcement Division who determines whether immediate referral is appropriate. Prosecution is not pursued for 1st violations if within 10 days of the NOV the source returns to compliance or applies for a variance. Variances are obtained from the Air Pollution Control Hearing Board. Prosecution of cases is delayed pending the Board's decision. Theoretically the $500/day per offense fine continues while the Board deliberates, again discouraging frivolous applications. An emergency variance may be obtained for vital breakdown conditions and a interim variance is available for up to 90 days but requires that the source and APCD develop a compliance schedule.

The trend in the APCD following lack of response to an NOV is to issue a letter of prosecution and begin a mutual settlement procedure. The preference is for abatement

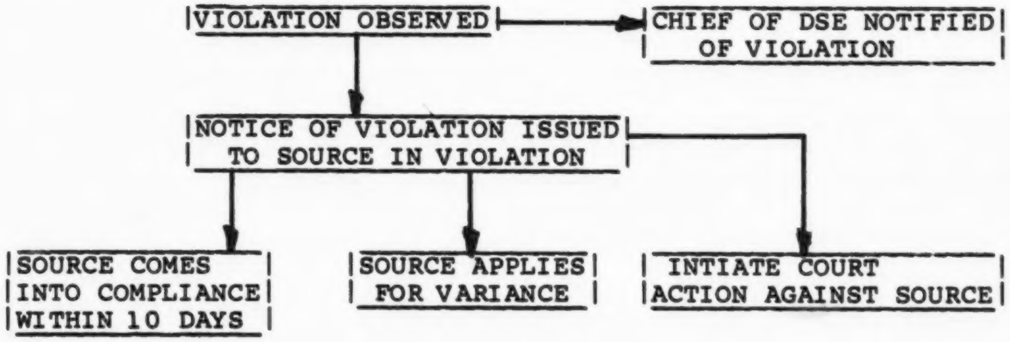
Figure L

SAN DIEGO ENFORCEMENT PROCEDURE

- ORIGINAL PROCEDURE -


VIOLATION OBSERVED
WARNING LETTER SENT TO SOURCE IN VIOLATION
(DELETED IN 1973)
SOURCE COMES INTO COMPLIANCE
DSE ARRANGES AN OFFICE CONFERENCE W/SOURCE
SOURCE COMES INTO COMPLIANCE
INITIATE COURT ACTION AGAINST SOURCE

- CURRENT PROCEDURE -


VIOLATION OBSERVED
CHIEF OF DSE NOTIFIED OF VIOLATION
NOTICE OF VIOLATION ISSUED TO SOURCE IN VIOLATION
SOURCE COMES INTO COMPLIANCE WITHIN 10 DAYS
SOURCE APPLIES FOR VARIANCE
INTIATE COURT ACTION AGAINST SOURCE

SOURCE: "Description of the Regulatory Process for the San Diego, California Case Study," PES, 1979.

programs through the Hearing Board in which a variance is granted subject to Board imposed conditions.

For sources with ongoing controllable problems the APCD had petitioned the Board for 5 Abatement Orders, as of January 1979. The order, in the form of an injunction, directs the source to come into compliance or cease operations. A mutually agreed compliance schedule must be developed or the agency unilaterally imposes a schedule.

The basis for issuing NOV's in 1978 was reported as follows:

Visual observation (surveillance)	32%
Source Test	2%
Equipment Observation during Inspection	65%
Complaints	1%

Note in Table 4-19 that until very recently, few violation cases were referred to counsel and even fewer convictions resulted. Although litigation is still rare, several major changes have occurred. The first was a marked improvement in the availabililty of legal resources. Prior to July 1978 the APCD was forced to submit a formal request to the County Board of Supervisors to use the services of County Counsel to institute a civil action (only the County Counsel can bring such actions). This left the APCD with 2 choices, going through the time-consuming process of submitting a request or instituting a criminal action. Neither of the choices was desirable, the former due to reasons of delay and the latter due to more stringent burdens of proof and judicial reluctance to stigmatize businessmen with criminal convictions. Now, due to a County Board resolution, the APCD can refer cases directly to the County Attorney.

In addition, about a year and a half ago the District Attorney's office assigned one attorney to receive all requests for air pollution case improved operations with prosecution of 38 of 40 cases referred.

TABLE 4-19

SAN DIEGO APCD FIELD ACTIVITIES ENFORCEMENT ACTIONS AND LEGAL ACTIONS

CATEGORY	PRIOR TO 1973	1973	1974	1975	1976	1977	CALENDAR YEAR 1978 (TO OCT)
FIELD ACTIVITIES							
ENFORCEMENT INVESTIGATIONS	--	--	--	--	3,053	2,508	2,992
COMPLIANCE INSPECTIONS	--	--	--	87	849	1,078	910
ANNUAL FORMAL INSPECTIONS	--	--	--	1,976	1,876	1,418	1,427
PERMIT ASSISTANCE	10,655	3,619	4,174	2,320	121	295	37
SURVEILLANCE INVESTIGATION	33,171	15,580	18,983	15,654	9,026	6,795	4,373
COMPLAINTS RECEIVED	1,863	487	407	347	399	415	358
COMPLAINT INVESTIGATION	6,257		1,724	1,439	1,337	1,731	1,298
ENFORCEMENT							
NOTICE TO APPLY (A/C-PO WARNING)	233	0	0	--	--	--	--
FIRST NOTICE OF VIOLATION	230	78	175	147	213	210	203
SECOND (OR MORE VIOLATIONS	45	36	69	71	151	192	182
CITATIONS[a]	--	--	--	--	1	5	0
OFFICE CONFERENCES	0	52	77	26	26	24	10
LEGAL ACTIVITIES							
CASES REFERRED TO COUNSEL	5	10	12	12	24	34	31
COURT CASES FILED	3	6	13	7	10	10	17
CONVICTIONS	2	5	13	2	6	12	16
FINES	$150	$1,450	$3,875	$50	$375	$2,690	$4,165
FINES SUSPENDED	--	$400	$2,500	--	$100	$100	$100

PART II:

CONCLUSIONS AND RECOMMENDATIONS
OF THE
OPERATIONS AND MAINTENANCE TASK FORCE

INTRODUCTION TO PART II

The goal of the Operations and Maintenance Task Force was to propose an Agency strategy for ensuring the proper operations and maintenance of air pollution control systems. In meeting this goal, the Task Force felt that it was important to understand State and local agency needs, recognizing that it would be these agencies who will have the primary responsibility for ensuring continuous compliance. Thus, the model programs and strategy contained in the recommendations section are based largely on the study of nine agencies and their programs.

The body of this report describes the programs employed by nine of the Nations's most effective and well-managed air pollution control agencies in their efforts to gain compliance with emission standards. Specifically, the Task Force conducted this study to:

- identify exemplary air pollution control programs and practices; and
- identify common problems and program needs.

The Task Force is well aware that the sections of this report describing the agencies' particular programs are not exhaustive. It is likely that an exclusive study of any single agency program would yield more information and insight. Although the agency findings reflect 1978 information, we understand that the agencies have not drastically changed their programs or policies since then. We believe that we have captured the essence of these programs and have fulfilled the intended purpose of conducting the studies.

What follows is a comparison of actual agency programs and practices to those proposed by the Task Force. The commentary is based on documentation of agency programs contained in this report, meetings between members of the Task Force and agency staffs, and the working knowledge of the Task Force members in the areas of emission standard setting, measurement and enforcement. This commentary is meant to highlight exemplary programs, and identify problem areas common to State and local agencies which could be addressed by EPA.

Chapter 5. CONCLUSIONS

5.1 Summary of Conclusions

- The nine agencies studied have the basic programs needed to attain continuous compliance. However, these programs currently emphasize initial compliance, and need to be modified to ensure continuous compliance.
  - All of the agencies studied impose general limitations on source emissions; yet these standards do not lend themselves to a ready determination of continuous compliance.
  - Most State and local agencies notify sources of their emissions requirements through general public notice; but relying on general notice does not provide an adequate means of informing sources of complex requirements, such as those needed to attain continuous compliance.
  - Some agencies use a permit as a means of notifying sources of their requirements; but even so, the agencies emphasize initial compliance -- failing to take advantage of the use of permits to impose O&M requirements.
  - All agencies provide for detection of violation through complaint investigations, surveillance, inspection and, in some cases, by requiring malfunction reports. Nevertheless, many continuous compliance violations remain undetected due to weaknesses in these detection strategies.
  - All agencies have some means of proving violations, i.e. establishing their occurrence and their magnitude; however, problems of accuracy, reliability, and expense plague these techniques.
  - All agencies have some system of progressive sanctions to remedy continuous compliance violations, but these sanctions are ineffective in preventing and correcting continuous compliance violations.
- The agencies studied address the continuous compliance problem in a piecemeal fashion. To solve the problem each agency needs EPA support to implement a consolidated continuous compliance strategy.

5.2 Conclusions

THE NINE AIR POLLUTION CONTROL AGENCIES STUDIED OPERATE THE BASIC PROGRAMS NEEDED TO ATTAIN CONTINUOUS COMPLIANCE. HOWEVER, THESE PROGRAMS EMPHASIZE INITIAL COMPLIANCE, AND NEED TO BE MODIFIED TO ENSURE CONTINUOUS COMPLIANCE.

1. All of the agencies studied impose general limitations on source emissions; however these standards do not lend themselves to a ready determination of continuous compliance. These limitations take the form of emissions standards contained in regulations, or, less frequently, they take the form of permit conditions. These complex standards are not source specific, and it is therefore difficult for the sources to interpret and compare them to measurable emissions. For example, an emissions regulation for TSP may state that an iron melting furnace (of a specified size) may not emit more than X tons pollutant Per Y tons steel produced. As the production rate changes so does the allowable emission rate. Further, as there are no gauges which continually read in units of tons of pollutant emitted, neither the source operator nor the agency inspector can determine if the emissions are in violation at any point in time.

   To ease the problem of non-specific standards, the Oregon, San Diego and Connecticut agencies are attempting to make their emission standards more directly measurable through specifying detailed, source-specific conditions in their operation permits.

2. Most state and local agencies notify sources of their emissions requirements through general public notice; however relying on general notice does not provide an adequate means of informing sources of complex requirements such as those needed to attain continous compliance. For example, most air pollution control standards contain a general statement requiring sources to properly operate and maintain control equipment. O&M standards would be more effective if they were individually set and negotiated with sources, to account for the uniqueness of each source-control match.

Some agencies use a Permit to Construct and Permit to Operate as a means of notifying sources of their requirements; but even so, they emphasize initial compliance, overlooking provisions for continuous compliance. Permits to construct are issued with little consideration of features such as materials of construction to ensure continued performance, or measures to allow ready determination of level of performance. Permits to Operate are often issued with overlong renewal periods (often exceeding four years), thus hampering the ability of agencies to adjust requirements.

Connecticut provides an instructive exception by adjusting its permit renewal periods based upon criteria related to the reliability of the control system and its potential impact should it fail. Further, San Diego, Oregon, and Connecticut are now writing permit conditions specifically aimed at improving continuous compliance.

3. All agencies provide for detection of a violation of emission standards through complaint investigations, surveillance, inspections and, in some cases, by requiring malfunction reporting. Nevertheless, many continuous compliance violations remain undetected due to weaknesses in these detection strategies. In fact, a few of the agencies studied reported that the detection of violations is a larger problem than enforcement against violators.

We found, for instance, that Chicago and Houston are the only two agencies that rountinely provide timely investigations in response to complaints. Other agencies allow a day or more to pass before the source is investigated. By that time the violation is usually corrected and forgotten before documentation can be established for use in future enforcement cases.

Surveillance programs are also weak components of detection strategies -- for two basic reasons. First, frequency of surveillance is a direct function of geographic proximity to the agency; and second, surveillance activities (like complaints) are generally limited to the detection of visible or odorous emissions.

Exceptions include Houston, where legal surveillance activities may include taking property line samples; Chicago, where the agency has employed the use of surveillance cameras atop buildings across the city to give total surveillance coverage of the city; and New York, where the agency targets surveillance against those sources suspected of non-compliance.

The effectiveness of inspection programs to detect violations is also limited by a few factors. Seven of the agencies studied give advanced notice of up-coming inspections, or schedule inspections on such a regular basis they are easily anticipated by sources and violations are easily corrected. Further, agencies typically inspect major sources only once per year, and therefore it is likely that continuous compliance violations (which occur an average of 12 times/ year and last 24 hours) will go unnoticed by inspectors. Iowa, on the other hand, successfully uses unannounced, irregularly scheduled inspections.

In regard to malfunction reporting programs, we found that many agencies either have no such program, or they rarely employ their authority to require malfunction reports. The agencies that do have such programs fail to routinely apply sanctions against sources in violation of the reporting requirements. As a result, most sources do not report breakdowns in their control equipment and most of the agencies know little of incidents of excess emissions.

4. All of the agencies studied have some means of proving violations, i.e. establishing their occurrence and their magnitude; however, problems of accuracy, reliability, and expense plague these techniques. Agencies use engineering evaluations, stack tests, and continuous monitors to determine the amount of pollution emitted from the sources they regulate.

Engineering evaluations, the most commonly used technique for compliance determination, are dependent upon the skills of the inspector or engineer; the effectiveness of the evaluations is severely threatened by high turnover rates, low pay, lack of training and guidance manuals, and the nonexistence of instack and portable monitors to determine compliance. North Carolina has begun to remedy the situation by holding regular inspector training programs to equip new inspectors and refresh those on board.

Stack tests, for the most part, are inappropriate for continuous compliance evaluations because they require notice to the source well in advance of the test, they only determine emissions levels over the period during which the test is conducted, and they are very expensive. In addition, conditions under which stack tests are conducted do not provide a test for reasonable worst case operations to assure compliance over the source's full operating range. Note that Oregon, in an attempt to overcome some of these problems, has employed the technique of intermittent sampling through abbreviated less expensive stack tests.

Continuous monitoring of emissions and of their surrogates is limited by the availability of technology, and is contingent upon quality control and quality assurance measures designed into these techniques. Few agencies have made it a practice to require sources to install the emissions monitors that are available because the monitors are expensive and, until recently, unreliable. As a result, continuous emission monitoring plays a very minor role in enforcement activities. By far the largest percentage of continuous monitors currently in use measure opacity, and SO_2 for large utility boilers. Connecticut has taken the lead in this area by requiring all of its large fuel burners (>5mm BTU/Hr.) to install opacity monitors.

Parameter monitors, which monitor surrogates of emissions (e.g.pressure drop and temperature of control equipment), are less expensive and more reliable than continuous emissions monitors. However, their use is currently limited by the lack of conversion factors to translate their readings into emissions levels.

5. All agencies have a system of progressive sanctions, but these sanctions are ineffective in preventing and correcting continuous compliance violations. Most agencies use informal warnings, Notices of Violation, or Abatement Orders as their principal response to violations. The less formal of these actions result in limited source responsiveness. In addition, the problems of appropriateness, tracking and documentation that agencies experience in applying these sanctions for initial compliance violations are compounded in cases of continuous compliance violations. Therefore, these sanctions provide little deterrent and remedial effect for continuous compliance violations.

More formal sanctions, such as civil actions and financial penalties, often involve judicial action where procedures are cumbersome. For the few cases that are referred for legal action, the result is frequently lengthy delays and postponements of 2-3 years before settlement. Further, penalties finally imposed by the courts have all too often been much smaller than the cost savings through delaying or avoiding compliance. Penalties, on the average, range between $200 and $500. Therefore, these sanctions provide little deterent effect for continuous compliance violations.

Agencies attempting to address these problems include New Jersey and Oregon with their systems of small administratively imposed fines--Connecticut with its system of administrative penalties set equal to the cost avoided by the source, and Chicago with its regularly scheduled Air Pollution Court.

NONE OF THE AGENCIES STUDIED HAS A CONSOLIDATED STRATEGY FOR ENSURING CONTINUOUS COMPLIANCE.

Although control of continuous compliance violations is the responsibility of the State and local air pollution control agencies, none of the agencies studied has defined a comprehensive strategy aimed specifically at keeping sources in continuous compliance. Instead, the agencies focus on the initial compliance problem and address the continuous compliance problem in a piecemeal fashion.

There is a need to integrate activities such as stack sampling, inspections, malfunction reporting, and permits to ensure a comprehensive agency approach in requiring sources to properly operate and maintain their control systems. For example, inspection schedulers should have the benefit of source malfunction reporting histories, inspectors should have the benefit of previous stack test data, and permit reviewers should have the benefit of inspectors' reports.

Chapter 6 - RECOMMENDATIONS

6.1 Summary of Proposed Continuous Compliance Strategy

- We recommend the establishment of a continuous compliance strategy in which each State and local air pollution control agency will:
    - Target a few sources of concern based on size, location, industry and control system category, malfunction reports and compliance history.
    - Establish continually measurable, source-specific operating standards for these targeted sources.
    - Employ operating permit programs or enforcement authorities to make these requirements enforceable.
    - Inspect sources for compliance with these specific operating standards.
    - Enforce against violators of the emission limits and operating standards.
- To address the design based causes of excess emissions, we recommend that the continuous compliance strategy be supplemented by:
    - Orienting new source design reviews towards continuous compliance
    - Developing minimal industry design standards in the private sector.
- We recommend EPA support the State and local activities by developing:
    - Criteria for targeting
    - Performance measures for O&M
    - Operating permit and NOE programs
    - Malfunction programs
    - Administrative Fines program
    - Design Review Guidance
    - Industry Design Standards

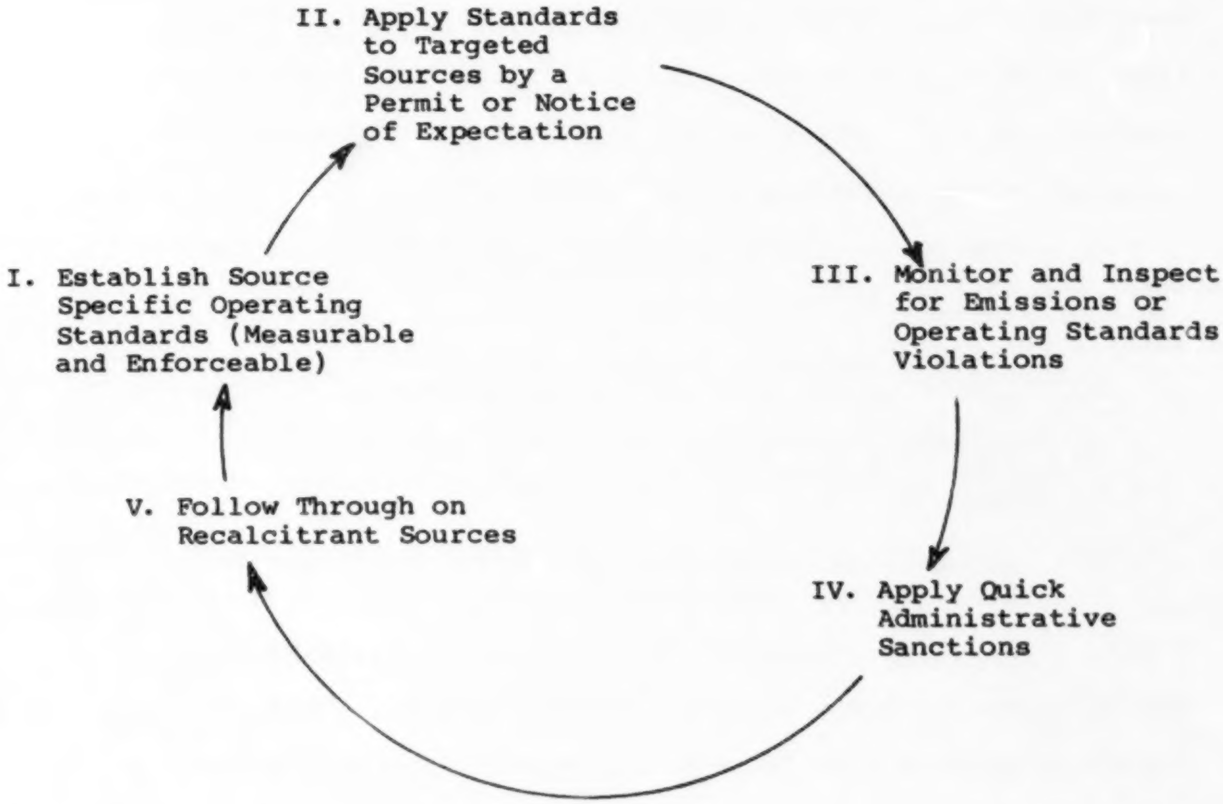
6.2 Proposed Continuous Compliance Strategy

This section describes each element of the proposed continuous compliance strategy. It is important at this point to recognize that State and local control agencies must implement proposed strategy. They have the lead responsibility for program implementation under the Clean Air Act, are physically closer to and have more interactions with sources, and have the vast majority of available resources. But, as we saw in the problem assessment, their capabilities are limited and their programs need improvement and reorientation towards continuous compliance. In addition, we feel that it is unrealistic to expect 257 State and local agencies to each individually undertake the technology and program development and applied research efforts needed to improve and expand the focus of their programs.

Therefore we recommend that EPA's continuous compliance program focus on developing, supporting, and improving those program components and tools needed by States and localities to implement the continuous compliance strategy. Since many of these program components already exist at the State and local levels, we will be building on existing programs.

The first six program elements we recommend, and discuss below, are aimed at supporting the continuous compliance strategy for existing sources. These program elements are steps to continuous compliance and are shown below in Figure M. The last two program elements described are aimed at the design based problems that result in excess emissions. Each program element will be discussed in terms of its role in the recommended strategy, State implementation and EPA actions needed to support State efforts.

Figure M -- STEPS TO CONTINUOUS COMPLIANCE


II. Apply Standards to Targeted Sources by a Permit or Notice of Expectation
III. Monitor and Inspect for Emissions or Operating Standards Violations
IV. Apply Quick Administrative Sanctions
V. Follow Through on Recalcitrant Sources
I. Establish Source Specific Operating Standards (Measurable and Enforceable)

STEP I OF RECOMMENDED STRATEGY -

ESTABLISH SOURCE SPECIFIC OPERATING STANDARDS:

Control agencies must adopt source specific operating standards that they can easily monitor for continuous compliance to supplement the existing general emissions limits. These standards will complement the existing SIP emissions limits; they will not change or replace them. Where the technology is available the operating standard could simply be an upper limit emission rate as measured by a continuous emission monitor. In cases where actual emissions cannot be easily measured, these standards would consist of:

- control equipment parameter limits (e.g., minimum pressure drops on a scrubber to ensure adequate collection efficiency),
- process parameter limits (e.g., maximum process weight limits to prevent overloading of control equipment),
- operating procedures for control equipment (e.g., turn preheaters on 1 hour prior to equipment start-up), and
- maintenance procedures for control equipment (e.g., replace bags once a year).

Limits on specific parameters will have to be tailored on a source-by-source basis for the targeted sources. This is likely to be true even for two sources with the same process and type of control equipment, because their sizing and individual design would probably be different. Other requirements may be applicable across whole classes e.g., requirements for preheating control equipment or requirements for certain parameters to be monitored.

PROPOSED EPA ACTION TO SUPPORT STEP I: EPA should provide States with guidance for developing these operating standards on an industry-by-industry basis. The guidance would include:

- specification of process, emissions, and control parameters to be monitored by the sources;
- operational procedures and routine and preventive maintenance activities;
- quality assurance, instrumentation, siting, recordkeeping, and reporting options to assure the availability and usefulness of the data needed to judge compliance with the standards;
- methods to determine reasonable ranges for these operation and maintenance variables at individual sources, and;
- data on the relationships between different sets of operating standards and the emission standards they approximate.

STEP II OF RECOMMENDED STRATEGY, PART I - APPLY STANDARDS TO TARGETED SOURCES:

We recommend that operating standards be applied on a targeted basis. We realize that immediate application of operating standards to all sources would overwhelm existing State and local programs. Furthermore, our findings show that 18% of the sources account for 82% of the documented emissions excesses.

Sources to be targeted would be identified based on selection criteria that reflect the agencies' environmental priorities. The number of sources to be covered and the detail of requirements to be applied would be chosen in a manner which anticipates the expected level of agency surveillance and enforcement. The number of sources with conditions would increase as resources allow. The detail of individual requirements would be modified as needed to assure individual source compliance.

PROPOSED EPA ACTION TO SUPPORT STEP II: EPA should provide the States with guidance on how to plan and target their programs. This will be particularly important at the outset of the continuous compliance initiative, for resource constraints will limit the number of sources each agency can focus on. Targeting will provide a mechanism so that agencies will be able to achieve the maximum benefit of enforcement programs at minimum cost.

States need guidance on how to determine which sources should be targeted for application of operating standards and how many sources should be targeted each year. EPA can provide this type of guidance by preparation of methodologies for the States to use in targeting sources. These could be based on: general environmental concerns (size, location, pollutant), individual source compliance histories, past performance of different industrial and control equipment categories (as determined by our problem assessment), and anticipated agency resources for continuous compliance.

STEP II OF RECOMMENDED STRATEGY, PART 2 - APPLY STANDARDS THROUGH PERMIT OR NOE PROGRAMS

The operation and maintenance standards discussed above have no value unless they can be applied as enforceable requirements on targeted sources. We feel that a State operating permit program is the most desirable long-term approach to imposing these requirements and specifying acceptable limits of performance on those sources identified in the targeting process. Alternatively, given the limitations on, or unavailability of, existing operating permit programs in some States, we recognize that some agencies may choose to start implementing the strategy using their enforcement authorities to apply requirements.

PROPOSED EPA ACTION TO SUPPORT STEP II: EPA should develop and support programs to apply operation and maintenance standards. For States that have an operating permit program this effort would include:

- preparing model authorizing legislation and implementing regulations,
- designing sample application and permit forms and suggesting procedures for their use,
- preparing guidelines for permit modificiation, amendment and renewal,
- suggesting administratively efficient appeal procedures,
- suggesting staffing patterns, and
- developing computerized permit handling and management systems.

For those agencies that do not have a functioning permit program, we recommend the use of a Notice of Expectation (NOE). An NOE would be a precursor to the current Notice of Violation (NOV) process. We found that the unappealing aspect of the NOV process is its reactive nature. The agency must wait for a violation to occur and detect it before it can move on to the first enforcement step, the NOV. The NOV defines and interprets the standard violated and may provide a minimal grace period to achieve compliance. In contrast, the NOE will inform the targeted sources of their compliance requirements prior to a violation. The NOE will:

- be issued to targeted sources after opportunity for source input,
- set down directly measurable or documented requirements which ensure compliance with emission standards, and
- make clear that failure to comply with the conditions specified would lead to future sanctions.

For States that choose to use their enforcement program to apply O&M standards, EPA should develop a model Notice of Expectation program to assist them. This model would include:

- interpretations of existing authorities providing for such a program,
- processes by which source input could be sought,
- suggested formats for requirements,
- use of Notices of Expectation in enforcement actions, and
- processes for modifying or amending a source's conditions.

STEP III OF RECOMMENDED STRATEGY, PART I - MONITOR AND INSPECT FOR VIOLATIONS:

We recommend that monitoring and inspection programs be planned to focus on targeted sources. This is necessary if we want these sources to conscientiously follow applicable operating standards. Monitoring of targeted sources will be easier when monitors and continuous records of performance are available to agency inspectors. We recommend that these be supplemented by inspection guides and audit procedures designed to overcome technical limitations of available personnel.

PROPOSED EPA ACTION TO SUPPORT STEP III: We recommend that EPA develop surveillance and audit instruments and techniques to verify source compliance with operating standards. These would include:

- portable instruments to measure emissions or emission surrogates,
- guidelines on how to take advantage of all the information available at the source and the agency to assess continuing compliance,
- procedures to allow stack testing for compliance to be conducted at the extremes of the allowed operating standards, and
- inspector checklists with associated compliance criteria to be prepared for industry and control equipment categories.

STEP III OF RECOMMENDED STRATEGY, PART 2 - IMPROVED MALFUNCTION REPORTING PROGRAMS

We recommend that improved malfunction reporting programs be developed. These programs would include industry-by-industry analyses of source performance. Using this data, control agencies could judge the acceptability of a given source's performance.

PROPOSED EPA ACTION TO SUPPORT STEP III: We recommend that EPA initiate efforts to develop a model malfunction program. By doing this, we could use the model program to help make State and local malfunction programs effective elements of a continuous compliance initiative.

The Model Malfunction Program would have to:

- define what is to be reported, by whom, and when,
- include methods to detect malfunctions,
- penalize failures to report or keep records, and
- provide packaged data handling and analysis systems.

EPA should further support this program by aggregating industry-wide data which could be fed back to State and local programs.

STEP IV OF RECOMMENDED STRATEGY - APPLY QUICK ADMINISTRATIVE SANCTIONS

We recommend that states adopt administrative fine programs. Administrative fine cases can be quickly initiated. These fines are particularly applicable for the minor or procedural violations likely to occur in a continuous compliance program. Administrative fines can be backed by the more powerful enforcement tools now available -- court injunctions and non-compliance penalties. The effectiveness of these tools will be enhanced through improvements in administrative procedures, inspection procedures, and source performance data that will result in better documentation of violations and reduced enforcement delays.

PROPOSED EPA ACTION TO SUPPORT STEP IV: We recommend that EPA develop an Administrative Fine Program for control agency use at the Federal, State and local level. As States and local agencies focus on continuous compliance they are increasingly going to find themselves dealing with small or procedural violations (e.g., failure to keep records) which may be indicative of larger emissions violations but which current enforcement tools cannot readily attack. Given that agencies have problems in court even when sources fail to install control equipment, control agencies may be hesitant to act against sources that fail to comply with minor or procedural requirements.

An Administrative Fine Program would be analogous to a parking ticket program, or EPA's unleaded fuels enforcement program. The program would consist of two basic elements:

- Source Notification -- This would cite the requirement violated, specify the applicable fine ($25 to $1,000), and notify the source of its right to appeal.
- An Administrative Appeals Process -- This would be a formal mechanism established within the control agency structure using hearing examiners.

Model program development by EPA would include:

- authorizing legislation (with supporting arguments),
- procedures for an administrative appeals process;
- sample fine schedules and rationales, and
- legal defenses to be presented in the first test cases.

STEP V OF RECOMMENDED STRATEGY - FOLLOW THROUGH ON RECALCITRANT SOURCES:

We recommend that States adopt the policy of concentrating on recalcitrant sources to prevent the deteriorating effect these sources have on levels of general compliance. With the adoption of the standard setting, compliance monitoring, and enforcement strategies recommended above, the job of detection, proof, and remedy of emission violations will become much easier. However, if State agencies are to have effective enforcement against recalcitrants they will have to follow through on their enforcement related activities. They will have to:

- continue applying escalating sanctions until the recalcitrant complies,
- conduct more frequent and thorough inspections of recalcitrants,
- give priority to administrative hearings involving recalcitrants, and
- amend permits or notices to adjust performance measures, and possibly amend regulations to close loopholes found in the course of an enforcement action.

EPA ACTION TO SUPPORT STEP V: As this step in the strategy is primarily one of States adopting a policy, the action EPA intends to take is to support State efforts. EPA will:

- continue to develop monitoring technology and to improve its reliability,
- supply experts to give testimony in particularly troublesome cases, and
- back State enforcement actions with Federal enforcement actions, in cases of persistant recalcitrance.

TWO RECOMMENDATIONS TO SUPPLEMENT THE STRATEGY

1. IMPROVE DESIGN REVIEW OF CONTROL EQUIPMENT: States must fully utilize the leverage they have over new sources to require that maintainability, operability and reliability be designed into control equipment. Our contractors' studies have shown that although all States conduct design reviews, they do so only for the purpose of initial compliance. As a result, there is no effort to encourage sources to build in needed access for maintenance, provide for monitoring capabilities, or prepare for malfunctions.

PROPOSED EPA ACTION: EPA should provide guidance on how to review control equipment design for continuous compliance capabilities. The guidance could include suggested criteria for:

- design (e.g. limits on undersizing and bypasses, and inclusion of access ports for inspection and maintenance),
- fabrication (e.g., specifications on materials of construction),
- installation (e.g., requirements to locate the equipment so it can be serviced), and
- monitoring (e.g, requirements for certain types of monitoring and record keeping for selected control systems).

2. DEVELOP MINIMAL INDUSTRY STANDARDS: We recommend the development of minimal industry standards for the design, fabrication, and maintenance of pollution control equipment to assist in alleviating problems commonly identified with ineffective equipment design. Currently, a source

which purchases control equipment is unable to identify specifications for the acceptable design of the control equipment. Thus, for example, the source has no basis for specifying adequate materials, instrumentation, component life times, or acceptance tests. Vendors, in addition, find that competition forces them to concentrate design efforts on meeting initial compliance requirements; those items needed only for continuing compliance take on a lower priority. Minimal industry standards for control equipment can be developed to fill many of these gaps. These standards could eventually minimize the need for the separate EPA design review guidance discussed above.

PROPOSED EPA ACTION: We recommend that EPA actively pursue the development of Industry Design Standards. Mechanisms exist in the private sector to develop these standards. For example, by working through the American Society for Testing (ASTM), EPA would be utilizing the private sector to provide sorely needed standards. ASTM's standard-setting process rests on its authority to convene a meeting of all parties interested in control equipment standards -- EPA, vendors, sources, and consultants. The parties then negotiate out the standards following established ASTM procedures.

To date, a panel of experts including equipment vendors, users and regulators has convened to discuss the proposal of minimal industry standards for design and maintenance of control equipment. The panel agreed that the proposal is desirable, and has recommended several areas where there is potential for the development of such standards in the immediate future. Initial research in this area was provided in the report "Feasibility of Establishing Voluntary Standards for the Air Pollution Control Equipment Industry" (PEDCO Environmental, Inc.; June 1980).

6.3 Proposed Application of the Strategy

- A Case Study

Under the continuous compliance strategy, a large source such as a 100 ton per year steel furnace with a baghouse would be targeted for attention. This source would be issued a Permit to Operate or a Notice of Expectation which would include tailored operating and maintenance standards as developed by EPA. For example, O&M standards for a baghouse might include pressure drop and temperature ranges for the baghouse, and frequency of bag inspection and replacement.

To inspect the source to determine compliance status, the control agency would send out inspectors unannounced at staggered intervals. The inspectors would be equipped with information on the source compliance history and guidelines on how to use the information (e.g., the number of acceptance malfunction incidents for that industry). Checklists with associated compliance criteria for the control equipment and portable instruments to measure emissions surrogates would be available to the inspector. Detection of violations would be increased as each agency requires sources to report any malfunctions of its control equipment.

In the case where the inspector uncovered a violation, the agency would initiate an enforcement action by applying the appropriate sanction based on the severity of violation, e.g., small administrative fines for the first few minor violations, escalating to civil suits and noncompliance penalties if the violations are not permanently corrected.

If the source is determined to be a recalcitrant the agency can seek recourse through escalation of penalties, and increasing surveillance of the source to uncover transient violations. Finally, the agency would amend its regulations and the source's permit (or NOE) to close any loopholes.

*U.S. GOVERNMENT PRINTING OFFICE:1981 341-082/239 1-3